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Report

Iowa State Horticultural Society

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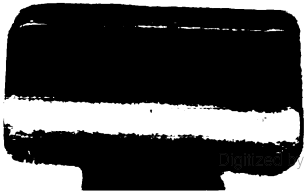
DAVIS, CALIFORNIA



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REPORT

OF THE

Iowa State Horticultural Society

FOR THE YEAR 1910

CONTAINING THE PROCEEDINGS OF THE

FORTY-FIFTH ANNUAL SESSION

HELD AT

Des Moines, Iowa, Dec. 13, 14, 15, 1910

ALSO TRANSACTIONS OF THE

AUXILIARY SOCIETIES

EDITED BY THE SECRETARY

VOLUME XLV

PUBLISHED BY ORDER OF THE GENERAL ASSEMBLY

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1911

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LETTER OF TRANSMITTAL.

To His Excellency, Beryl F. Carroll, Governor of Iowa:

SIR: I transmit to you herewith the forty-fifth annual report of the State Horticultural Society, which includes the transactions of its auxiliary societies for the year 1910.

I trust the society will continue to receive the support and kindly consideration of the executive and of the legislature.

Respectfully,

WESLEY GREENE,
Secretary.

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OFFICERS

OF THE

Iowa State Horticultural Society

FOR THE YEAR 1911

WILLIAM LANGHAM, President ..... Cedar Rapids
M. J. GRAHAM, Vice-President ..... Adel
WESLEY GREENE, Secretary and Librarian ..... Davenport
FRANK O. HARRINGTON, Treasurer ..... Williamsburg

DIRECTORS.

First District—C. G. Blodgett ..... Mount Pleasant
Second District—John Forster ..... Albia
Third District—Geo. H. Van Houten ..... Lenox
Fourth District—A. B. Dennis ..... Cedar Rapids
Fifth District—Millard Harrington ..... Williamsburg
Sixth District—C. O. Garrett ..... Adelphia
Seventh District—W. B. Chapman ..... Correctionville
Eighth District—C. H. True ..... Edgewood
Ninth District—W. C. Haviland ..... Fort Dodge
Tenth District—L. A. Clemons ..... Storm Lake
Eleventh District—C. F. Gardner ..... Osage
Twelfth District—Eugene Secor ..... Forest City

The society keeps its rooms open at the capitol during the usual office hours and visitors are always welcome.

The society was organized for the purpose of disseminating correct information concerning the cultivation of such fruits, flowers and trees as are adapted to the soil and climate of the State. To more fully carry on this line of work, the secretary desires to keep in touch with horticulturalists of the State by correspondence or otherwise, and asks for reports on the nature and extent of fungous diseases or insect pests which have proven destructive in the past or are noticed for the first time in any locality, and that specimens be sent to him for identification and study, and to be used as material the society is now collecting for its museum. Reports on the condition of the fruit industry solicited from fruit growers in every township in the state.

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FRUIT DISTRICTS.

REPRESENTED BY THE DIRECTORS NAMED ON PRECEDING PAGE.

First District—Lee, Des Moines, Louisa, Henry, Washington, Jefferson, Van Buren, Keokuk, Wapello and Davis.

Second District—Mahaska, Monroe, Appanoose, Marion, Lucas, Wayne, Clarke, Decatur, Ringgold and Union.

Third District—Adams, Taylor, Montgomery, Page, Mills, Fremont, Pottawattamie, Cass, Audubon, Shelby and Harrison.

Fourth District—Muscatine, Scott, Clinton, Jackson, Jones, Cedar, and Linn.

Fifth District—Benton, Johnson, Iowa, Tama, Poweshiek, Marshall and Jasper.

Sixth District—Story, Polk, Warren, Boone, Dallas, Madison, Adair, Greene and Guthrie.

Seventh District—Carroll, Crawford, Monona, Woodbury, Ida and Sac.

Eighth District—Dubuque, Clayton, Delaware, Fayette, Buchanan, Black Hawk, Grundy and Bremer.

Ninth District—Butler, Franklin, Hardin, Wright, Hamilton, Humboldt, Webster, Calhoun, and Pocahontas.

Tenth District—Buena Vista, Cherokee, Plymouth, Sioux, and O'Brien.

Eleventh District—Allamakee, Winneshiek, Howard, Chickasaw, Mitchell, Floyd, Worth and Cerro Gordo.

Twelfth District—Winnebago, Hancock, Kossuth, Emmet, Palo Alto, Dickinson, Clay, Osceola and Lyon.

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EXPERIMENT STATIONS.

COMMITTEE IN CHARGE OF STATIONS.

S. A. Beach, Central Station keeper.....Ames
C. G. Patten, Northeastern Station keeper.....Charles City
P. F. Kinne, Northwestern Station keeper.....Storm Lake
F. O. Harrington, Southeastern Station keeper.....Williamsburg

SUPERVISING COMMITTEE FOR 1911.

Charles F. Gardner, one year.....Osage
C. L. Watrous, two years.....Des Moines
M. J. Graham, three years.....Adel

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LIST OF MEMBERS.

HONORARY LIFE MEMBERS.

Bessey, Dr. C. E.....Lincoln, Neb.
Brackett, G. B., United States Pomologist.....Washington, D. C.
Cheney-Hand, Mrs. Mary.....Charles City
Crosby, J. O.....Garnavillo
Gaylord, Edson .....Nora Springs
Hinrichs, Dr. Gustavus, 4106 Shenandoah Avenue.....St. Louis, Mo.
*McGeehon, R. D.....Atlantic
Sage, J. R.....Des Moines
Shankland, E. B.....Jennings, La.
Swalm, Albert W., United States Consul.....Southampton, England
Wilson, James, Secretary of Agriculture.....Washington, D. C
Wragg, Mrs. Hannah .....Waukee

HONORARY MEMBERS.

Bussey, W. P.....Omro, Wis.
Haralson, Charles .....Excelsior, Minn.
Huntington, Arthur .....Montana
Jamieson, Rev. J. F.....Des Moines
Schermerhorn, A. V.....Ridgefarm, Ill.

LIFE MEMBERS.

Amelang, William .....Ottumwa
Anderson, J. P.....Lamoni
Arey, Prof. M. E. .....Cedar Falls
Armitage, Dr. Geo. I.....Hopeville
Arthur, Robert C.....R. F. D. No. 2, Des Moines
Artman, Rev. Charles .....Mt. Vernon
Atkin, D.....(Address unknown)
Ayres, H. F.....Wilton Junction
Bacon, George S.....Tacoma, Wash.
Bailey, Dr. S.....Mount Ayr
Bailey M..... .....Winterset
Baker, Prof. H. P.....(Center Co.) State College, Pa.
Baker, J. W.....Washington
Ballard, W. C.....Meek Block, Des Moines
Bannister, Dr. M.....Ottumwa
Baker, Alvin F.....Baldwin, Kan.
Barker, John.....Scribner, Neb.
Bartholomew, J. L.....(Address unknown)

*Deceased.

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Bartholomew, N. ..... Des Moines
Beach, Prof. S. A. ..... Ames
Bear, W. S. ..... Decatur
Bechtle, C. R. ..... Halsey, Neb.
Bechtel, J. M. ..... Hamburg
Becker, Dr. Frederick ..... Clermont
Beebe, Frank S. ..... Bengal, Minn.
Bemis, Fred P. ..... Davenport
Bender, J. E. ..... Oakland
Berryhill, James G. ..... Des Moines
Bezdek, Wesley ..... R. F. D. No. 1. Cedar Rapids
Bing, J. C. ..... Ottosen
Bingham, S. J. ..... Murray
Black, G. D. ..... Independence
Blackman, T. W. ..... Nevada
Blaise, J. P. ..... Des Moines
Bliss, G. R. ..... Ames
Blodgett, C. G. ..... 307 E. Exchange, Mount Pleasant
Bralliar, Floyd B. ..... Route No. 3, East Station, Nashville, Tenn.
Branson, A. ..... Oskaloosa
Bremer, Arth. ..... 210 North Ninth Street, Lyons
Brown, Grant. ..... Story City
Bomberger, W. M. ..... Harlan
Bourne, H. S. ..... Webster City
Brink, C. C. ..... Steelville, Mo.
Brown, Ed. ..... Mitchellville
Brown, W. F. ..... Boone
Burnap, W. A. ..... Clear Lake
Bushnell, H. C. ..... Cedar Rapids
Byrnes, J. H. ..... Waterloo
Cameron, John E. ..... 3516 Olive St., Kansas City, Mo.
Campbell, C. A. ..... Mt. Zion
Canedy, Leroy ..... Marion
Carpenter, O. W. ..... Coon Rapids
Chapman, W. B. ..... R. F. D., Correctionville
Chaffee, John M. ..... Ontario, Cal.
Clark, W. J. ..... Cedar Rapids
Clemons, L. A. ..... Storm Lake
*Clute, L. G. ..... Rural Route No. 2, Manchester
Collins, Miles ..... South Avenue, Davenport
Collman, A. F. ..... Decherd, Tenn.
Colver, H. F. ..... Mechanicsville
Conrad, Prof. Henry S. ..... Grinnell
Converse, D. C. ..... Fort Atkinson, Wis.
Corlett, John E. ..... 310 N. Eighth St., Oskaloosa
Councilman, S. J. ..... Boone
Craig, Prof. John ..... Ithaca, N. Y.

*Deceased.

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Crawford, Wm. ..... Alliance, Neb.
Curtis, B. O. ..... Paris, Ill.
Dawson, W. P. ..... Aurelia
Dayton, John F. ..... Waukon
Dean, James H. ..... Rural Route No. 2, Des Moines
Dennis, Dr. A. B. ..... Box 717, Cedar Rapids
Deuel, C. E. ..... Washington
Deur, C. H. ..... Missouri Valley
Dewey, R. E. ..... De Soto, Mo.
Dewey, F. G. ..... Thompson, Ohio
Dice, John S. ..... Route No. 2, Cedar Rapids
Dickerson, D. M. ..... Lawton
Dillon, W. H. ..... De Soto
Eddy, Walter ..... Boone
Edmondson, E. F. ..... Perry
Edris, Perry ..... Oskaloosa
Edwards, M. G. ..... (Address Unknown)
Erwin, Prof. A. T. ..... Ames
*Evans, D. ..... 405 Walnut Street, Des Moines
Felter, H. L. ..... Washta
Felter, Victor ..... Cherokee
Ferris, B. F. ..... Hampton
Ferris, Earl ..... Hampton
Fink, Prof. Bruce ..... Oxford, Ohio
Forster, John ..... Albia
Fourt, Dr. Frank ..... Fairfield
Fowler, P. L. ..... Osceola
Freeman, H. S. ..... Paris
Frisbee, Jerome B. ..... DeBeque, Colo.
Fultz, W. S. ..... Muscatine
Gardner, C. F. ..... Osage
Garner, E. R. ..... Route No. 3, Newberg Oregon
Garrett, C. O. ..... Adelphi
Garrett, Charles O. ..... Mitchelville
Goodwin, E. A. ..... Baxter
Goss, S. G. ..... Lehigh
Goy, W. R. ..... Tabor
Graham, J. M. ..... Mechanicsville
Graham, Thomas ..... Decorah
Graham, M. J. ..... Adel
Gray, A. W. ..... Eldora
Green, W. H. ..... East 9th & Hull Sts., Des Moines
Greene, Laurenz ..... Ames
Greene, Wesley ..... Davenport
Gustafson, Herman ..... Rural Route No. 3, Mediapolis
Gwinn, W. W. ..... Ford
Haag, J. S. ..... Hospers

*Deceased.

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Hanssen, Henry H. .....Long Grove
Harrington, F. O. .....Rural Route No. 1, Williamsburg
Harrington, Millard .....Williamsburg
Harris, A. W. .....Sibley
Hartman, A. .....Route No. 1, Clinton
Havenhill, Mark .....Fox, Ill.
Haviland, W. C. .....Fort Dodge
Healy, G. B. .....Sioux City
Hicks, W. M. .....Elmwood, Chicago, Ill.
Hill, J. W. .....Des Moines
Hinkley, M. E. .....Mount Vernon
Hoffman, John A. .....Rural Route No. 4, Carroll
Hoffman, I. W. .....Rural Route No. 4, Carroll
Hove, P. E. .....R. 1, Keister, Minn.
Hoyt, Ed. .....Scotch Grove
Hoyt, B. L. .....Scotch Grove
Irish, Prof. H. C. .....Missouri Botanical Garden, St. Louis, Mo.
Jackson, J. P. .....Puyallup, Wash.
Jacobs, H. .....Thompson
Jensen, J. W. .....P. O. Box 303, Exira
Johnson, J. H. .....Inwood
Jones, J. W. .....P. O. Box 515, Boise, Idaho
Jones, R. E. .....Webster City
Jones, V. A. .....Forest City
Kalb, Peter .....Rural Route No. 2, Arlington
Kelsey, H. M. .....Route No. 1, Cedar Rapids
Kinne, P. F. .....Storm Lake
Kirk, I. R. .....Mason City
Klinzel, Rev. Clement .....St. Anthony, Indiana
Langham, William .....Rural Route No. 1, Cedar Rapids
Larrabee, Hon. Wm. .....Clermont
Lau, Henry .....Rural Route No. 4, Davenport
Lawrence, A. H. .....(Address unknown)
Lemon, R. K. .....Mitchelville
Lewis, W. H. .....Winterset
Lister, John .....Conrad Grove
Little, Prof. E. E. .....Ames
Livingston, G. W. .....Monroe
Lochrie, Geo. A. .....Lorimor
Lonsdale, James .....Dale City
Lower, W. B. .....Sioux City
Luther, Agnes Vinton .....151 Scotland Road, South Orange, N. J.
Mahr, John W. .....Devils Lake, N. D.
Mathews, B. A. .....Knoxville
Mathews, Robert A. .....Independence
Macaulay, T. B .....4007 Dorchester St, Montreal, Canada
Macbride, Prof. T. H. .....Iowa City
McGee, Emma .....Farley
Marshall, A. H. .....513-515 W. Locust St., Des Moines

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Mason, H. P. ..... Kingsley
McClelland, Albert ..... Adelphi
McClelland, Gideon ..... Polk
McCoy, H. D. ..... Knoxville
McCune, J. T. ..... Ottumwa
McElroy, W. O. ..... Newton
McHose, J. B. ..... Boone
McPherrin, J. M. ..... 1018 Fifth St., Des Moines
Meek, Dale ..... Granger
Meneray, F. W. ..... Council Bluffs
Merrill, G. W. ..... Grinnell
Miller, A. M. ..... Des Moines
Miller, H. A. ..... Spirit Lake
Mincer, C. E. ..... Hamburg
Monroe, W. C. ..... Nave Vista, New Mexico
Moon, R. G. ..... Bedford
Morley, Rev. John P. ..... Marengo
Mossman, Levi ..... Rural Route No. 6, Vinton
Mueller, Herman A. ..... St. Charles
Murphy, J. W. ..... Glenwood
Newdick, L. W. ..... Fort Dodge
Overly, F. L. ..... 113 Welch Ave., Ames
Page, Chas. N. ..... Des Moines
Pammel, Prof. L. H. ..... Ames
Parsons, M. De L. ..... Irvington
Patten, C. G. ..... Charles City
Peddie, Alex ..... Emmetsburg
Pellett, Frank C. ..... Atlantic
Phillips, Nelson G. ..... Altoona
Phillips, Simon ..... Avery
Pidgeon, David A. ..... New Providence
Plummer, A. L. ..... Rural Route No. 1, Altoona
Porterfield, D. A. ..... Traer
Pratz, H. N. ..... Albion
Preston, O. S. ..... Narrows, Oregon
Price, Prof. H. C. ..... Columbus, Ohio
Proudfit, J. J. ..... Rural Route No. 1, Altoona
Prouty, J. N. ..... Humboldt
Pugsley, M. ..... Woodbine
Putz, John ..... Elkport
Rarey, Henry W. ..... Griswold
Raymond, H. C. ..... Council Bluffs
Reeves, Elmer M. ..... Waverly
Reitter, Fred W. ..... R. F. D. No. 3, Britt
Rich, O. W. ..... Kennewick, Wash.
Rich, W. G. ..... Star Route, Council Bluffs
Richey, Wm. T. ..... Albia
Richman, E. F. ..... Muscatine
Rickey, W. C. ..... Thornburg

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Rockhill, Harlow ..... Route No. 2, Conrad
Roenfield, F. ..... R. F. D. No. 1, Des Moines
Rohlfs, R. M. C. ..... Rural Route No. 4, Davenport
Rooker, Silas T. ..... Mitchellville
Ross, O. N. ..... Webster City
Rowen, James D. ..... (Address unknown)
Schaeffer, G. J. ..... R. F. D. No. 3, Forest City
Secor, Alson ..... Des Moines
Secor, Eugene ..... Forest City
Secor, Willard ..... Forest City
Sellers, T. S. ..... Des Moines
Shaul, W. H. ..... (Address Unknown)
Sheets, James A. ..... Hampton
Sherman, E. M. ..... Charles City
Shimek, Prof. B. ..... Iowa City
Shivvers, H. ..... R. F. D. No. 4, Tacoma Wash.
Smith, O. O. ..... Route No. 6, Manchester
Snider, S. J. ..... Osage
Snyder, David C. ..... Center Point
Snyder, S. W. ..... Center Point
Spencer, F. P. ..... Randolph
Steigerwalt, W. F. ..... Ames
Steinman, Christian ..... Mapleton
Stephens, E. F. ..... Crete, Nebr.
Stone, John Y. ..... Glenwood
Stuart, B. ..... 2617 Walnut St., Des Moines
Stubbs, Chas. R. ..... Conrad
Stutz, G. W. ..... (Address unknown)
Summers, Prof. H. E. ..... Ames
Talley, S. H. ..... Hills City, Kas.
Tallman, R. S. ..... Paton
Tanner, T. C. ..... Palo
Tatum, E. ..... West Branch
Temple, John T. ..... Davenport
Thompson, Jasper ..... Forest City
Thornber, Prof. W. S. ..... Pullman, Wash.
Town, Silas ..... Rural Route No. 1, Casey
Trowbridge, S. A. ..... Des Moines
True, C. H. ..... Edgewood
Trueblood, Stanford ..... Mount Pleasant
Van Houten, George H. ..... Park, Whatcom Co., Wash.
Van Houten, Arthur W. ..... Davenport
Verploegh, Abraham ..... Pella
Wagner, J. F. ..... Sunbury
Wall, J. F. ..... Mt. Ayr
Warburton, Clyde W. ..... Independence
Warren, C. D. ..... Des Moines
Warren, J. R. ....Meldrith, 13 Alma Road, Camberwell, Victoria, Australia
Watrous, C. A. ..... Des Moines

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Watrous, C. L. ..... Des Moines
Watrous, E. L. ..... Des Moines
Welch, E. S. ..... Shenandoah
Westcott, E. B. ..... Clarinda
Whitten, Dr. J. C. ..... University of Missouri, Columbia, Mo.
Whittington, M. G. ..... Rural Route No. 1, Hedrick
Wier, W. T. ..... Gladstone, Ill.
Wiese, Henry ..... Kenwood Park
Wilbur, D. ..... Floyd
Wiley, J. H. ..... Mt. Zion
Willard, W. O. ..... Grinnell
Williams, H. P. ..... (Address unknown)
Williams, A. G. ..... Campbell, Cal.
Williams, Wendell P. ..... Danville
Wilson, Geo. A. ..... Des Moines
Wilson, Silas ..... Nampa, Idaho
Wilson, S. W. ..... Des Moines
Wolff, P. A. ..... R. F. D. No. 1, Cedar Rapids
Worth, W. T. ..... Mondamin
Wragg, M. J ..... Des Moines
Wragg, W. E. ..... Waukee
Wuesthoff, Eugene ..... 1201 Railway Exchange Bldg., Milwaukee, Wis.
Wundt, Karl R. ..... Burlington
Young, J. E. ..... Webster City
Youngerman, Oscar ..... Council Bluffs
Zeimer, Arthur C. ..... Funke Bldg., Lincoln, Neb.
Zsherney, Jr., F. E. ..... Amana

ANNUAL MEMBERS.

Andersen, Hans S. ..... Kimballton
Avery, Minnie ..... Council Bluffs
Champion, J. W. ..... 14 Elmsleigh Park, Paignton, Devonshire, England
Conkling, W. S. ..... Muscatine
Dooley, J. C. ..... Des Moines
Ferree, Donald ..... Waukee
Horner, William ..... Redfield
Howell, E. ..... Louisiana, Mo.
Mosnat, H. R. ..... Belle Plaine
Musgrave, M. G. ..... Altoona
Nielsen, J. P. ..... Box No. 3, Coulter
Purdy, George H. ..... Mason City
Rathbun, J. E. ..... Goodell
Simons, A. A. ..... Hamburg
Thomas, George D. ..... Des Moines

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CONSTITUTION.

ARTICLE 1. This society shall be called the Iowa State Horticultural Society, and shall have perpetual succession.

ART. 2. The object of this society shall be the promotion and encouragement of horticulture and arboriculture, by the collection and dissemination of correct information concerning the cultivation of such fruits, flowers and trees, both deciduous and evergreen, as are adapted to the soil and climate of Iowa.

ART. 3. Said society shall hold its annual meeting each year for the transaction of its business at such time as may be fixed by said society, at which meeting, officers shall be elected as follows: A president, vice-president, secretary, treasurer, and librarian, who shall serve one year. The society shall also elect one-half of a board of directors, the full board not to exceed twelve in number, who shall serve two years, except vacancies on the board may be filled for the unexpired term.

ART. 4. The secretary shall keep a full and accurate account of the proceedings of the society. He shall open and carry on a correspondence with such fruit growers, florists and horticulturists in general throughout the State as manifest an interest in the purposes of the society. He shall annually make up a report for publication, embracing such information upon fruit growing as may come within his reach, with a full report of the business affairs of the society, and shall be allowed a reasonable compensation for his services.

ART. 5. The treasurer shall have charge of the funds and other property of the society, and dispose of them as decided by the board of officers. He shall pay out no money, except upon the warrant of the secretary and countersigned by the president. He shall make up a true and full report of all moneys and other property put into his hand, for the benefit of the society with disbursements and vouchers annually and present the same to the secretary on or before the first day of the meeting in December, and shall be required to give bond in such sum and with such securities as the board shall direct, which bond shall be approved by the president and filed with the secretary. The depository of the funds of the society shall be selected by the executive committee, and the treasurer shall exact a personal bond, or a bond of a responsible indemnity company for such depositary, to indemnify him from all loss occassioned by his deposits. Under no circumstances shall the treasurer or his bondsmen be released from liability to the society until full and complete settlement with, and payment to, the society has been made by him.

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ART. 6. All accounts brought against the society shall be audited by the board.

ART. 7. The members present of the board shall constitute a quorum for the transaction of business at any regularly called or adjourned meeting.

ART 8. Any person may become a member of this society by the annual payment of $1, or a life member by the payment of $5. Any person hereafter becoming a life member of an auxiliary society in payment of five dollars shall thereby become a life member in this society. The annual members shall have the right to participate in all discussions and vote upon all questions except the election of officers. Honorary life membership shall be conferred only on those who have rendered valuable service to the society, and the manner of admission to life membership shall be as follows. A motion to confer life membership shall lie over until the following session and must receive the unanimous vote of those voting on the question. Should any objection be filed with the president prior to the time of taking the final vote, or if a negative vote or votes, shall appear, the application shall be declared rejected.

ART. 9. Officers of this society shall be elected by the vote of life members and of those who have become members for two consecutive years last preceding such election.

ART. 10. The fiscal year shall commence and end at the December meeting of each year, and the retiring board shall settle the business of the previous year.

ART. 11. All amendments to the constitution shall be offered in writing and receive the endorsement of the society by a two-third vote of the members present. The amendment shall then lie over until a suceeding session of the same annual meeting, and must again receive the approval of two-thirds of the members present.

BY-LAWS.

First—The officers of this society shall be elected on the evening of the third day of the December meeting, annually.

Second—The officers of this society shall hold their respective offices until their successors are elected and qualified, except the term of the office of secretary, which shall terminate on the first Monday of April following, at which time he shall forward his books and papers to his successor.

Third—The president, and in case of his absence, the vice-president, secretary, and treasurer, shall constitute an executive committee, who shall perform any business deemed necessary for the society in the absence of the board. That the executive committee be invited to sit as consultative members of the board of directors.

Fourth—The annual membership shall cease on the day preceding the first day of the annual meeting of the society in December.

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Fifth—No person shall be eligible to the office of president, vice-president, secretary, or treasurer, who has not been a member of the society three consecutive years previous to election.

Sixth—No person holding the position of station keeper shall be eligible to the office of director of this society.

Seventh—These by-laws may be amended at any general meeting of the society, by a vote of two-thirds majority of members present.

RULES.

1. Any plant that has been or may hereafter be produced by State funds shall not be eligible for premiums offered by the society on new fruits.

2. Each station keeper shall properly care for all stock sent him for experimental purposes, and carefully guard all experimental work intrusted to him, and report upon the condition or value whenever requested so to do by the board of directors, or by the supervising committee.

3. Each station keeper shall be furnished with a record book in which he shall note the condition and behavior of everything received and keep a complete record of all work pertaining to the experiments he is conducting.

4. Superintendents of stations shall acquire no ownership in the stock received by them for experiment, or in any new fruit originated by them in station work. Control and ownership is reserved by the society.

5. If any superintendent of an experiment station neglects to perform the duties required of him, except for reasonable cause, his station may be discontinued by the board.

6. Superintendents of stations shall meet with the supervising committee, at Des Moines, on the evening of the first day of the annual meeting of the State society.

7. The compensation of superintendents of stations shall be $25 per annum and actual expenses while attending the annual meeting, provided all reports required shall have been furnished.

8. The experimental work of this society shall be in charge of a supervising committee of three to be elected by the board of directors, each member of this committee shall serve three years. One shall be elected at each annual meeting, at which time vacancies in the committee shall be filled if any exist. The committee may annually elect its own chairman who shall keep a full record of the work and the expenditure of the committee, and shall report the same in writing to the board of directors at their annual winter meeting.

9. The supervising committee shall have authority to procure and distribute experimental stock to the several stations, to direct all experiment work, to employ experts, if necessary, and to require such reports from each station keeper as they may think best.

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10. It shall be the duty of the supervising committee to make personal examination of the condition of the work at each station once in each year. They shall report their observations in their annual report.

11. The supervising committee shall receive $2.00 per day while absent from home, visiting stations, and actual necessary traveling expenses and postage while performing the duties required of them; provided all reports required shall have been furnished.

12. When experiment stock is sent to any superintendent of station, an itemized invoice of the same shall be sent him by mail, in order that the superintendent may make as few mistakes as possible in identifying the varieties received.

13. The reports of the directors and other transactions of the district societies shall be edited and prepared for publication by the secretaries of the respective societies.

14. No paper or report shall ocupy more than five pages of our annual volume and the secretary is authorized to edit all reports and papers.

15. The four district societies shall be allowed an equal sum for their support, and for the present the appropriation of each society is fixed at one hundred fifty dollars ($150) annually.

16. The sum of Two hundred fifty dollars ($250), or as much thereof as shall be needed, be appropriated for carrying on the work at the experiment stations in 1911. This sum to include expenses of experiment station keepers.

17. That the president be empowered to appoint delegates to meetings of the state horticultural societies of the states adjoining Iowa.

18. The reports of the society shall not be sent to county or district societies with an annual membership fee of less than $1.

19. That the time of the annual meeting of the society be fixed for the second Tuesday in December.

20. That Wesley Greene, William Langham, W. M. Bomberger, Geo. H. Van Houten and M. J. Wragg be appointed a committee on legislation.

21. That the executive committee shall be a committee on program for the ensuing year.

22. That the reports of the twelve directors of the state society be submitted to the secretary of the society on or before the first day of the annual meeting.

23. Except by unanimous consent no paper or address shall occupy more than twenty minutes in its delivery, and in discussing questions no member shall speak more than five minutes, nor more than once until all who desire to speak have spoken, unless by permission of the society. It is the duty of the president to enforce this rule, and it is the privilege of any member to demand its enforcement.

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PREMIUMS ON FRUIT.

The society offers $420 in premiums for fruit, viz: $100 in premiums for exhibits of apples, pears, or other fruits, or nuts, grown in each of the three districts, and $75 for sweepstake premiums. The first sweepstake prize shall be $15, the second prize $10, in each district.

There shall not be less than thirty varieties for a sweepstake prize in the northern district; not less than fifty varieties in the central district, and not less than sixty varieties in the southern district. The northern district shall comprize the three northern tiers of counties; the central district, the next three tiers south thereof, and the southern district, the south three tiers of counties.

Ten dollars is offered in each of the three districts for the best three boxes of apples, three varieties; and five dollars for the second best three boxes of apples, three varieties.

One district can not use the unearned money set apart for another district.

Entries for plate premiums not eligible in sweepstakes, but a duplicate plate may be entered.

No exhibitor shall be allowed to take first and second premiums in the same class; nor will a premium be paid to any exhibitor unless a member of this society.

The judges shall award premiums according to the merits of each exhibit; but no exhibitor shall be awarded a premium to exceed one dollar for each plate of any standard variety of apple or other fruit shown, nor more than two dollars for any plate of seedling apple or other fruit or nut.

The entries to be made with the secretary in the name of the exhibitor, and the fruit to be placed on exhibition the first day of the meeting.

All plates of fruit in competition for premiums must bear an entry card with the correct name of the variety.

Fruit entered for premiums must be grown in the district from which it is shown.

A plate of fruit shall consist of five specimens; each specimen shall be in good condition, with the stem and calyx well preserved, of average size, color and form, not marred by insects or fungus.

The boxes should be either 10½x11½x18 inches, or 10x11x20 inches, the end pieces three-fourths inch thick, the sides three-eighths, and the top and bottom one-quarter inch thick.

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PROCEEDINGS

OF THE

FORTY-FIFTH ANNUAL MEETING

OF THE

Iowa State Horticultural Society

HELD AT DES MOINES, IOWA

DECEMBER 13, 14, 15, 1910

TUESDAY MORNING SESSION.

The society was called to order at 10:00 A. M. by the president, William Langham, of Cedar Rapids. The invocation was pronounced by the Rev. J. F. Jamieson, of Des Moines.

ADDRESS OF THE PRESIDENT.

My Dear Horticultural Brethren—This season of 1910 has been the "winter of our discontent." Amid the wreckage of blasted hopes and promises unfulfilled it is difficult to rise to the dignity and enthusiasm which should characterize the opening address at this, the forty-fifth annual meeting of our Society.

I might launch out in a doleful funeral oration which would seem quite proper at this time, or I might, in a feeble way, exploit some pet theory or ideal horticultural commonwealth after the manner in Bacon's New Atlantis, or Plato's Republic, or Campanella's City of the Sun, or Harrington's Oceana, but I shall refrain and instead shall do some plain but good-natured talking; and if at times it may seem like scolding or fault-finding, I plead this excuse, that as I am an old school master, these qualities are my greatest and most brilliant accomplishments.

BOOSTING.

I have heard a great deal said on this floor and in other quarters, about the great attendance had, and wonderful interest shown at the annual meetings in some of our sister states—especially to the north. This talk

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makes me tired. Do you not know that "night brings out the stars?" The greater the difficulty in attaining an object, the greater the effort and enthusiasm. I want to remind you that Iowa in a general way is pretty well fixed horticulturally. If we had a thin, attinuated, and uncertain fruit list in this state you would see this room and adjacent corridors crowded to overflowing by people seeking horticultural knowledge. Mere numbers in membership does not measure the influence and usefulness of a society.

Really I have been expecting that some of our members would be asking for a letter from our society to the one dearest to their hearts. as church people do in changing their homes. And I would be in favor of giving them credentials if they were not such royal good-fellows. But I think we should do some real boosting. We want young blood in our society, in truth we must have it. Let each one of us this coming year help to swell the roll of life members.

LADIES AUXILLARY.

Shall our Society have a Ladies Auxiliary?

I believe this question will not down until settled in the affirmative. Other horticultural societies have preceded us in this matter. When it comes to first-class material Iowa takes no second place. From her southern to her northern limits, from the Mississippi river to the Missouri, the flower of noble womanhood is found in every section of her vast extent.

PAY DEBTS.

During the year 1908 our Secretary published a "monthly bulletin of Plant Life" or more concisely "Iowa Horticulture." In reality each number was a delightful magazine; and I want to record a prophecy right here, that a bound volume of "Iowa Horticulture" in the years to come will fetch a good royal price, even at auction.

I do not know just what official action was taken by our secretary in launching that publication. But I do know within my own knowledge that it was talked up in session, and out of session, all claiming that such publication was necessary if we would keep abreast of the times.

Under this pressure our Secretary undertook and carried out the wishes thus expressed, and in so doing incautiously advanced considerable sums of money. Now there is yet due and unpaid $700.00 to $800.00. Our Society through its board of directors should take measures to liquidate that indebtedness. There is no question about our duty so to do. Our Society was an accessory both before and after the fact. And we should pay it without cutting the Secretary's salary in two.

GREATER EXPERIMENTAL WORK.

Turning back the hand of time I recently took down from the shelf volume 33 (1898) of the Iowa Horticultural reports. Would you believe it, I became so interested in its pages that the book never went back to its accustomed place until I had thoroughly gone through it.

Those were halcyon days in the history of Iowa Horticulture and of our Society. There were experiment stations galore where new varieties

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of fruit and even old ones, were tested by competent hands, and the results given. That volume is worth its weight in gold—virgin gold—to the new beginner. If this society had never done a single thing except to give that volume to the people of this state, it would have fully repaid every dollar it has received. And there are other volumes of that period which are worthy companions. I yearn for a cycle of the days of old. In these later years we have become more philosophical, more pedantic, more theoretical, more anything, but practical.

The last decade and especially the last lustrum has brought before the public a multitude of new seedlings which nature in her generous and lavish way has scattered here and there, and who knows but what there is among them just what we want.

When our funds permit, I hope to see them tested. It is well known that we have in our state at least five soil areas. (Six if we count the moraines.) In experiment work in the future, these soil areas should be recognized and covered. Next to climatic conditions that of soil is most important. Without increasing our present experiment stations, this could be easily accomplished. We have in every section of the State at present reliable fruit growers who without cost to us would gladly test stock furnished to them and report results. I have spent many dollars testing new varieties of fruit, a very large percentage proving worthless, at least on our soil. But there were a few grand prizes, as for instance the Gregg, Cuthbert and Cumberland raspberries. All this work should have been done by the experiment stations throughout the State and the results promptly sent out broadcast to the whole people. Greater publicity is what we must have.

SHALL THIS SOCIETY TEST OUT ALL SEEDLINGS IN WHICH IT IS FINANCIALLY INTERESTED.

Twenty-five years ago, nearly, Professor Budd began the work of plant breeding at Ames, in quest of varieties better suited to the climate of our state than those which we then possessed. His near successors carried on the work in a greater or lesser degree, and yet our hearts have grown weary in waiting. So far as I know there is not a tree which they produced worthy of a place in our fruit lists. Eleven years ago I sat here and heard Professor Craig—he of the silver tongue, recount the work of crossing for the year and giving the number of seed secured from crossed fruits and duly stratified, I was entranced as I listened to the presentation of the subject. I thought of those wonderful seeds by day and dreamed of them by night. But alas! So far as results are concerned, they seemed to have remained stratified.

In 1903 the experiment station at Ames issued a catalogue of fruits growing on the experimental grounds. There was an imposing list of seedlings and crossed fruits, mostly apples. Seven years is a long time, but I have not seen any of those creations listed by nurserymen. If a fruit of real merit makes its appearance, you can depend that that wide awake class of business men, called nurserymen, will promptly push it. They measure the worth of a new fruit as accurately as the barometer guages the climatic conditions of our earth. You touch the button and

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they will do the rest. Recently, (1909) Professor Beach has given us a new list which contains the "number of trees and varieties of different kinds of fruit which were in the station orchards June 30, 1908," aggregation 4240. This represents what the Professor calls, "the survival of the fittest." In his last report previous to this one he stated "that the number of apple seedlings of known parentage produced at the Iowa station which were there growing in the station nurseries amounted to 8,861." It appears that the years intervening between the two dates, had a disastrous effect on numbers.

In placer gold-mining after the dirt and gravel have been washed out, the precious metal is found associated with sand, usually a black sand. It is the custom of the miners to accumulate this gold bearing sand for stated periods, and then by special process separate the gold from the sand. They call this process "cleaning up."

Personally I am in favor of pausing (keep in mind I say *pausing*) long enough to clean up this accumulation of horticultural black sand and gold. We as a society owe it to the state whose creature we are, and who pays the bills, that every seedling of known or unknown parentage, in which we have an interest, (and we certainly have an interest wherever our money has gone, or else we have been misappropriating its funds) should be brought into fruitage at the earliest practical moment. It is as important to test out seedlings as it is to produce them. The one great overshadowing object in our plant breeding work, I take it, is to produce the ideal apple. That apple should have good size, color, quality and keeping properties in the cold storage which 99 out of 100 people possess namely a cellar or cave, and the tree should be productive and hardy throughout the state. When we once reach the goal we will throw care and worry and experiments to the winds. Perhaps we have the tree now—in embryo so to speak. Let us bring it to the light. That tree when once in the orchards of the state will be worth more yearly, far more than all the gold-dust and nuggests which lay at the foot of Marshall's statue in the California building at Chicago in 1893.

Perhaps I am pessimistic but it has always appeared to me that juggling with the secrets of nature is even more—far more—hazardous than dealing in options on the Chicago board of trade. In either case while the possibilities are apparently great, the probabilities are exceedingly small. Nature guards her Kingdom well. In truth the persistent, untiring, and I might say, heroic efforts in the fascinating field of artificial cross-polinization of fruits and the many failures, or at least, meager returns, constitute the one great tragedy in the history of Iowa horticulture. Here duty and prepotency are terms dear to the scientific but the great mass of the people care to hear only of results. If in this "cleaning up" process we find we have failed in reaching the desired object, it simply proves that the crosses which have been made, were not congenial, and that in the future we must proceed on new lines.

In connection with the foregoing there is another idea, or rather a theory which I should like to see tested out. Many persons claim that they can tell much of the future worth of an apple tree or seedling by its foliage, bark, manner of growth, in short its general appearance. Some

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scientists perhaps all, affirm that the hardiness of a tree can be approximately determined by the starch and cell growth in the wood and leaves as shown by the microscope. I have some faith in these claims. Let us appoint a committee of the ablest tree experts we have, or can get. Let that committee inspect every apple tree seedling whether of known or unknown parentage in which we have an interest. Let it select, by the tests above named, 50 or 100 of the most promising and top-work cions in bearing trees for speedy fruitage. If that committee can turn the trick, we have cut the Gordian knot and cheapest way to success.

DEMONSTRATION WORK IN GRAFTING AND BUDDING.

For years I have desired to see a school of instruction in the art of grafting and budding not only at our annual state meeting, but also at our district meetings as well. This school should be conducted not at the regular sessions, but in a convenient room or annex. Due notice should be given in the program and otherwise of the hours in which such instruction will be given. The teacher should be selected early in the session so that he may come amply provided with the necessary material.

BULLETINS.

Our Secretary this season printed and sent out a bulletin covering information on the following topics: Object of our Society; Reports and Membership; Profits of Fruit Culture; Fruit List; Fungicides and Insecticides. I had the pleasure of distributing quite a number of copies, and the people who received them were delighted. I would like to see that bulltin slightly enlarged, put into the hands of every one who is interested in horticulture in our state. Was it Mahomet who said, "If the Mountain does not come to me I will go to the Mountain." If the people do not come to us, let us go to the people.

THE FUTURE.

What of our future procedure in Iowa Horticulture? Stand pat, work, wait, hope, ever holding in mind (in a metaphorical sense of course), the laconic words of the Old Continental Leader to his men: "Pick your flints and keep your powder dry."

Ladies and gentlemen, I greet you one and all, and devoutly wish that each day may be replete with good will and profit as well as pleasure.

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REPORT OF THE SECRETARY.

FINANCIAL STATEMENT.

Receipts.

21 Life Members	$105.00	
30 Annual Members	30.00	
Contingent fund	300.00	
Total		$435.00

Disbursements.

Expressage:		
Wells-Fargo & Co., express	$ 7.57	
Pacific Express Co.	.25	
United States Express Co.	18.14	
Adams Express Co.	6.35	
American Express Co.	8.94	
White Line Transfer Co.	5.75	
Total		$ 47.00
Books, Binding, etc.:		
Samuel Rhodes, books	$ 47.00	
Dr. L .H. Pammel, books	2.09	
American Book Co., books	2.50	
Florists Publishing Co., books	17.25	
Des Moines Book Bindery, binding	2.80	
Baker-Trisler Co., cards	5.76	
Total		$ 77.40
Work—		
H. B. McGarraugh	$ 3.00	
Isaac Williams	11.00	
B. Burgem	1.00	
Seth P. Etter	1.00	
M. E. Hutchinson, stenographer	43.50	
Jessie M. Redmon, stenographer	17.50	
Blaise & Blaise, stenographer	75.50	
Total		$152.50

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Printing, Engraving, etc.:			
Bishard Bros., programs and labels....	$ 32.00		
Star Engraving Co., engraving	19.90		
Board for delegates	7.55		
Treasurer's Voucher	135.00		
Due Secretary from last report.....	76.25		
Total		$270.70	
Total disbursements			$547.60
Balance due Secretary			$112.60

There has not been a season in the last fifty years so unfavorable to tree fruits as 1910 has been; a semi tropic March brought the trees into bloom a month to six weeks earlier than the normal time for such development, then the low temperature from the 16th to the 27th of April left little fruit uninjured, except in a few sheltered locations.

The same climatic conditions prevailed, not only throughout Iowa, but over the entire upper-Mississippi Valley and extended down the river to the high ridge commonly known as the Ozarks. Orchardists in southwestern Missouri report a fair crop, and apples were more or less abundant in counties on the western border as far north as Iowa. Kansas, Oklahoma and Arkansas reported 15 to 30 per cent of a crop of apples; Illinois suffered as badly as Iowa, where less than 5 per cent of a crop was gathered. The apple crop of the country however, was as large as last year and our markets are now as well supplied with this fruit as they were a year ago.

About one-third of a crop of strawberries, raspberries and grapes was gathered. The dry, warm fall ripened the grapes so that the quality of this fruit was better than usual.

The climatic conditions of last spring were a severe test of the value of orchard heaters; nearly all attempts to save the crop by their use resulted in failures. Orchard heating like other economic problems, will require the expenditure of large sums of money and much labor, before a satisfactory solution is obtained. The orchard heater, like the spray-pump, has come to stay, and it will have a place in every well regulated orchard equipment. It is not possible to heat all out-doors with a few gallons of oil, there will, however, occur frequently, conditions when the use of heaters in the orchard will save the crop and pay well for the money and labor expended in using them.

It is the opinion of many orchardists that there will be a less number of codling moth and curculio to injure the fruit crop for a year or two; should experience demonstrate the truthfulness of this belief, freedom from the attacks of these two pests of the orchard may in part compensate for the loss of the fruit crop this year.

The exhibit of fruit is not as large as it was a year ago, but some of the fruit shown will grade as high as apples grown in any other section

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of the country and further demonstrates, if such proof is necessary, that as good apples can be grown in this state as elsewhere, and that it is not necessary to leave Iowa if you want to grow apples for market.

As there will be a session of the legislature this winter it has been suggested that we make an effort to get a law on the statute books that will give more power to park boards over the planting of trees in parkings so there may be better trees along the streets.

We also suggest that the Society ask for a larger appropriation so it may do more effective work in promoting the interests of horticulture in the state. We should have a printing fund to issue bulletins and circulars when needed.

Three years ago we issued a preliminary list of the native plants of the state; there is still calls for it and the edition is nearly exhausted. It should be revised and enlarged so as to include the cultivated plants of the state. Such a publication would be of permanent value to every person interested in plant growth.

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TREASURER'S REPORT.

Elmer M. Reeves, Treasurer, in account with the Iowa State Horticultural Society.

Receipts.

December 10, 1909, to balance on hand as per report	$1,118.59	
January 12, 1910, to State Auditor's warrant	1,000.00	
April 13, 1910, to State Auditor's warrant	1,000.00	
July 18, 1910, to State Auditor's warrant	1,000.00	
December 8, 1910, to State Auditor's warrant	1,000.00	
December 9, 1910, to twenty life memberships	100.00	
December 9, 1910, to twenty-nine annual memberships	29.00	
Total receipts		$5,247.59
Paid out on warrants		3,626.10
Balance on hand		$1,621.49

Disbursements.

587	E. H. Riehl, premium on nuts	$ 10.00
588	D. A. Moffitt, premium on fruit	14.00
589	F. P. Spencer, premium on fruit	5.00
590	Minnie Avery, premium on fruit	2.00
591	J. E. Bender, premium on fruit	2.00
592	Dr. A. B. Dennis, premium on nuts and expenses	25.06
593	J. J. Proudfit, premium on apples	13.50
594	M. J. Graham, supervising committee and director expenses	7.38
595	E. O. Worth, premium on apples	7.00
596	Eugene Secor, expenses as director	15.00
597	John Forster, expenses as director	11.12
598	C. G. Blodgett, expenses as director and premiums	20.56
599	C. G. Patten, expenses as station-keeper	21.80
600	Millard Harrington, premiums	5.50
601	C. H. True, premiums	71.25
602	C. O. Garrett, premiums and expenses as director	25.92
603	P. F. Kinne, station fee and expenses	40.42
604	W. C. Haviland, expenses as director	14.25
605	F. O. Harrington, expenses, station fee and premiums	57.64
606	L. A. Clemons, expenses as director and premiums	25.42
607	W. M. Bomberger, expenses as president	33.70

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608	W. B. Chapman, expenses as director	19.00
609	Wm. Langham, expenses as vice-president and premiums	20.06
610	B. Stuart, premiums	20.50
611	W. O. Willard, expenses as director	6.95
612	Chas. F. Gardner, expenses supervising committee.	23.85
613	J. W. Murphy, expenses as director and premiums.	105.60
614	Chas. O. Garrett, premiums	12.50
615	E. Howell, premiums	15.00
616	H. L. Felter, premiums	10.00
617	E. M. Reeves, salary as treasurer	100.00
618	Wesley Greene, contingent fund	300.00
619	Laurenz Greene, delegate to Minnesota	19.30
620	Frank C. Pellett, delegate to Illinois	25.82
621	Prof. S. A. Beach, station fee and expenses	29.20
622	Prof. A. T. Erwin, delegate to Wisconsin	37.99
623	Wesley Greene, salary for two months to Feb. 13..	250.00
624	F. P. Spencer, expenses as delegate to Missouri...	23.26
625	F. O. Harrington, allowance for Southeast Society.	150.00
626	E. Blakeman, allowance for Northeast Society....	150.00
627	A. S. Caulkins, allowance for Northwest Society....	150.00
628	J. P. Hess, allowance for Southwest Society.....	150.00
629	Wesley Greene, salary to April 13	250.00
630	C. G. Patten, care of experimental trees	150.00
631	Wesley Greene, salary to June 13	250.00
632	S. K. White, experimental work	14.00
633	Wesley Greene, salary to Aug. 13	250.00
634	Wesley Greene, salary to Oct. 13	250.00
635	C. G. Patten, care of experimental trees	150.42
636	Capt. C. L. Watrous, expenses as supervising committee	14.13
637	Wesley Greene, salary to December 13, 1910	250.00
	Total	$3,626 10

The following committees were appointed:

On President's Address—W. B. Chapman, Frank C. Pellett, C. G. Blodgett.

On Secretary's Report—Eugene Secor, John Forster, Millard Harrington.

On Treasurer's Report—P. F. Kinney, T. C. Tanner, W. C. Haviland.

REPORT OF DIRECTOR OF THE FIRST DISTRICT.

C. G. BLODGETT, MT. PLEASANT.

In making my annual report the weather usually occupies a small part of my attention. Should I leave that part out this year, one very round character would be sufficient to represent the yield of nearly all of

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the fruits, but I deem it worthy of record to note some of the most unusual weather that I have ever observed. In December of 1909 we had a deep fall of snow that gave several weeks of good sleighing and protected vines and roots but the warm weather of November had started the buds of some fruit and shrubbery so that there was considerable complaint of winter killing.

Nothing very remarkable of February, only for that month it was comparatively mild. Snow gradually disappearing with but two days below zero. On the 20th I noted the first robin, but early in March blue birds, larks, black birds and others were added and on the 13th, soft maples were in bloom and before the end of March some of the fruit tree bloom was out, a full month earlier than the average. I looked at the thermometer at daylight and only two mornings of the month was it as low as 22 degrees and as high as 56 degrees. This fine weather continued until the 16th of April when we had some inches of snow, then freezing weather for nearly the rest of the month. This of course killed all fruit bloom and also took off the leaves and it was a question for several weeks whether some trees would ever put forth foliage again. A few half dormant buds came on quite late but failed to mature much fruit. I doubt if there was one bushel of apples gathered in Henry county.

At the county fair there were but twelve plates of apples and six of those came from one orchard, which had sharp northwest exposure. A few peaches but no cherries, pears or plums. Of small fruits the strawberries as usual came out best; a fair half crop I believe. I did not see a box of raspberries or blackberries although there might have been some. Grapes that had made a foot of growth and were showing cluster buds were entirely killed and some varieties never recovered, especially Campbell and Niagara. Concord as usual best, giving nearly one-half crop from secondary buds.

We have often heard of an off-year and 1910 takes the top seat in forty years of my experience. And yet we cannot forget that through September and October we gathered, semi-weekly, a few very fine Dunlap strawberries. At first one berry and two creams but later several boxes and their fragrance still lingers like a dream.

The outlook for another year is quite flattering, I believe. Trees have made a good growth and buds well developed with foliage very healthy and stayed on late.

A little dry for small fruits through October and November, but with snow soon for protection, I see no reason why we should be discouraged, indeed I am quite hopeful that we shall be bothered less with insect pests than for some years. My reason for this is that there has been no fruit for them to propagate in.

REPORT OF DIRECTOR OF SECOND DISTRICT.

JOHN FORSTER, ALBIA.

The fall of 1909, October 11th, 12th and 13th, we well remember the freezing of hundreds of bushels of apples all over Iowa. The question

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would naturally arise, what effect will this freezing have on the fruit crop of 1910. The fruit buds appeared not to be hurt or even weakened in vitality from the fact that all trees old enough to bear fruit bloomed heavily and apparently strong and gave promise for a bumper fruit crop as far as the tree or bloom had to do with it.

But the ruler of the Universe and this old world that we are permitted to live in, only reminded us again, that man can plant, but God giveth the increase. But listen to me, God never places man in a position without providing some way or means of escape. So it is with the would-be successful fruit grower, we as tillers of the soil and fruit producers, have got to get down to scientific basis, to reap a creditable income from our high-priced land in Iowa.

We horticulturists have studied fruits and care of orchards and have imparted some valuable information along this line, and after we hear from Brother Spencer, J. P. Morley and others on the subject of fighting frost, I am now satisfied we will be equipped with the knowledge how to protect from frost.

The fruit crop in my section is generally expressed as a failure, however, I occasionally hear of a few apples. Apples are shipped to Albia by the carload from southwestern Missouri, from the car retailed as low as $1.25 per bushel, such varieties as Ben Davis, Jonathan, Winesap.

I am not fully prepared to say how the conditions or prospects are for a fruit crop for 1911. I find a difference of opinions as to the outcome. When I was a school boy we studied cause and effect, and I firmly believe the cause for the early blooming of all kinds of fruit was from the effect of the snow melting off the Rocky Mountains in February. When I was out on the Pacific slope in August in conversation with some of the old Pioneers they said they never had seen the snow go off the Mountains so early and leave so little snow piled up on the Mountains, as it was in February 1910. We remember the warm sunny days in February and March start the sap and the trees were in full bloom in March, then followed storms and severe freezing in April leaving the leaves and bloom as yellow and brown as yellow corn meal; killing many peach trees and the extremely dry summer has somewhat disturbed my rest for 1911 fruit crop.

REPORT OF DIRECTOR FROM THIRD DISTRICT.

J. W. MURPHY, GLENWOOD.

The season of 1910 was one of great extremes. March came in like a lion as the saying goes, and continued mild, dry and hot, not even a frost, rain or snow, and the temperature went up as high as 94 degrees, seldom under 60 degrees. This brought the fruit buds out long before the usual time of blooming, and by the first of April they were in bloom and the prospects were never better as everything in the tree-fruit line was full of bloom, except peaches which were killed last year during the October freeze, which also got the apples on the trees.

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The second week in April the weather began to get cold and wet, and on the 15th, 16th, 17th we had a snow storm and three days freeze, with a high wind from the northwest which wiped out all our bright hopes for a bumper crop, which were more favorable than ever before at that season of the year. However we had a fine crop of strawberries and of good quality. Raspberries and blackberries were practically a failure on account of the vines being winter killed. Grapes were frozen back twice after blooming and still we had about a third of a crop.

We had one fruit grower in my district who had nerve enough to prepare oil pots and place them in his orchard in time to save the crop. This was C. E. Mincer of Hamburg, Iowa, who had a fine crop this season. He had a wonderful display at the National Horticultural Congress at Council Bluffs this fall, which held up the credit of my district in pretty good shape for this season.

The prospects are good for a crop next season. The trees are in fine condition. Fruit buds are plentiful, and we are planning to get on the circuit with our "Great Iowa Display of Prize Winners" next year.

REPORT OF DIRECTOR OF THE FOURTH DISTRICT.

A. B. DENNIS, CEDAR RAPIDS.

The October freeze of 1909, and the late freezes of May 1910 came very near vacating the office of director in the fourth district, from the fact they left no fruit or nut crop to report. In the forty-four years I have resided in Iowa, I have never seen so complete a failure of all fruits and nuts. Yet strange as it may seem, one man in Cedar Rapids had one bushel of peaches on one tree and another in Linn county had one hundred fruits on several trees, and here and there from two to twelve peaches on different trees throughout the district. Another man reports one peck on one of his trees. Perhaps the following per cent is nearer correct for the fruit crop: Apples, 5 per cent; plums, 2 per cent; cherries, 8 per cent; pears, total failure; peaches ½ per cent; grapes, 33 1-3 per cent; gooseberries and currants, total failure; strawberries, 30 per cent; dewberries, 40 per cent; blackberries and raspberries, 22 per cent. Nut crop nearly a failure. Hickory, not a nut in the district; chestnut, 1-2 per cent; black walnut, 1 per cent; hazels, 5 per cent; butternut, total failure.

The squirrels have my sympathy, for their short Christmas dinner and their skeleton New Year parties.

REPORT OF DIRECTOR OF THE FIFTH DISTRICT.

W. O. WILLARD, GRINNELL.

The winter of 1909-10 seemed very favorable for fruit trees, vines and plants. We had no protracted severe cold weather, and the ground well protected with snow until early spring. The prospect seemed very fav-

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orable for an average crop of all kinds of fruit, until the severe freezing weather in late spring.

The apple and all tree fruits were entirely destroyed and other kinds greatly damaged. Strawberries produced the best crop of all the small fruits, the average was about 25 per cent of a crop. Grapes about 10 per cent from late bloom, but a few black raspberries and no currants or gooseberries.

Ornamental shrubs, the elm and many other trees lost their foliage, nature clothed them a second time but the foliage never seemed as large and dense as usual.

The dry weather has been favorable to healthy foliage. Trees have made a fair growth and the wood seems to be in a well ripened condition. On account of the drouth and protracted cold weather would be very trying on our more tender varieties of trees and plants. A good mulch would be a very great protection.

REPORT OF THE DIRECTOR OF THE SIXTH DISTRICT.

C. O. GARRETT, ADELPHI.

Of course we shared in the general calamity that befell the whole middle west in the spring of the year 1910. After the best prospects in years were blasted in so short a time we are truly thankful that we were spared our trees, shrubs and plants.

In fact it seems miraculous that our fruit trees should suffer much less than the known and supposed hardy trees of the native forest.

Take for example the box-elder and the beautiful elms. Some of the latter were devoid of foliage throughout the entire season and what the outcome will be I will not venture a guess, time alone will tell.

The severe drouth throughout the summer and still continuing with the lack of snow thus far has certainly had some effect on all fruit trees and plants, but the apple seems in the poorest condition to withstand it just now.

As is often the case unexpected things happened from the freeze. Half hardy Japan plums and Jap hybrids, peaches, chicacas and American plums showed scattering fruit. Likewise here and there were found some varieties of apples. Ordinarily this would be of little or no consequence but I mention it not because of the survival of the fittest, but because any fruit survived at all.

The same conditions occurred with small fruits, but not attended with so near a total loss. Strawberries gave 1-3 to 1-2 crop of variable quality. No gooseberries or currants. Fair crop of blackberries set but the dry weather cut them short until 50 to 60 per cent of a crop was marketed.

Grapes varied from a total failure to 40 per cent of a crop of very good quality. Some vineyards in young thrifty condition failed to produce even a basket of grapes, while other vineyards near, gave 40 per cent of a crop.

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While our loss of the year 1910 has been severe and falls heavy, we are now concerned about the future. Let us continue to plant in faith and reward will surely come.

REPORT OF DIRECTOR OF THE SEVENTH DISTRICT.

W. B. CHAPMAN, CORRECTIONVILLE.

The report of the seventh district differs in no respect from those of the other districts of the state—it is only a part of the same distressing tale. Of tree fruits there was literally nothing; of strawberries there was one-third of a crop, and of grapes 25 per cent; other small fruits did nothing. Of course, this was all due to the premature June weather in March followed by the severe freezing weather of April 26, and the "cleaning-up" freeze of May 6. The outlook is good for the coming season, the only unfavorable feature being the extreme dryness of the ground. No one is discouraged—fruit growing in this district is on too solid basis for that—and everybody is looking forward with much confidence to the coming year.

REPORT OF DIRECTOR OF THE EIGHTH DISTRICT.

C. H. TRUE, EDGEWOOD.

The winter weather that prevailed during the month of April last for an entire week proved as destructive to the fruit crop of the 8th district perhaps as in any other section of the State. The story of our losses is too familiar to repeat. Added to the great loss of fruit of all kinds considerable injury especially to the younger orchard trees is noticeable, resulting no doubt both from the severe cold of October 1909 and the April blizzard of 1910.

The unusually heavy snowfall of our last winter afforded great protection to all plants and trees, and its very gradual disappearance in the springtime, wet up the soil so effectually as to greatly lessen the effects of the extremely dry weather that prevailed during midsummer. On the other hand the deep snow mentioned was largely responsible for the great destruction of young nursery trees by the numerous rabbits whose natural food supply was hidden under drifts of snow.

The very few apples that remained on the trees—after the freezing of April 19th and 26th were beset with innumerable insects that were far in excess of the fruit that they preyed upon—thus rendering thorough spraying necessary as usual—and for which labor there was at least some recompense since the price of the fruit that we saved was more than doubled over the average price in favorable seasons.

Grape vines seemed to recover to a greater extent from the effects of freezing than most fruiting plants—and some of the older vines gave a light crop of fruit but we never witnessed a reserved bud to start under the original one that had been frozen off.

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Plums, cherries, raspberries, currants and gooseberries were too scarce to receive mention, while of blackberries there were a very few. Strawberry plants that had received winter protection gave a fair supply of fruit during the early part of fruiting time—but was cut short by the midsummer drought that followed. We believe that the growth of fruit trees and plants has been at least normal and numerous fruit buds are now in evidence and we have reason to hope that our past years losses will be in a large measure repaired by a liberal supply of general fruit products—of the year that is to follow.

REPORT OF THE DIRECTOR OF THE NINTH DISTRICT.

W. C. HAVILAND, FORT DODGE.

The year 1910 opened with one of the finest fruit prospects Iowa has possessed for years. The buds were numerous and very large and strong.

March came in with no frost in the ground and bright sunny May-day weather, continuing thus until the third week in April bringing forth all vegetation and the bloom of trees and shrubs.

The Shade-bush which blooms about April 25th was arrayed in its white beauty March 25th and the Prunus triloba in its radiant splendor April 8th instead of May 10th or 15th.

Each day we lived in fear that the weather might take a sudden chill and yet hoped that the good physician would tide us past the danger point; but on the evening of April 22d the wind changed to the northwest and came down upon us like a roaring lion. All night we heard the branches snap and crack, and the dawn of the 23d was ushered in with the earth again clothed in winter garments, and the trees and shrubs which the day before were beautiful in their bud and bloom, were now draped in heavy mourning for the glowing prospects which were a thing of the past.

After these freezing blasts of wind and snow were over the belated buds came forth and as the season advanced we found we still had enough apples (just a taste) to convince us the apple will still grow in old Iowa. The gem of the Union.

From one hundred acres of Duchess we gathered seven bushels of apples. From twenty-five acres of Wealthy about three hundred bushels. There were a few Yellow Transparent and Antonovka but none of other varieties not even the Northwestern Greening or Whitney.

There was a fair crop of Early Richmond cherries but a failure of late varieties.

The plum and grape crop very light. Strawberry one-half crop, which was the result of a second bloom after the frosts. No currants, gooseberries or blackberries and but a few raspberries.

We sprayed sections of the orchard using three distinct formulas, as follows:

First—The Rex lime and sulphur and arsenate of lead.

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Second—Arsenate of lead with self-boiled lime and sulphur.

Third—Woolfat, sulphur and lime and arsenate of lead.

After giving each of the three combinations a fair test I could discern no difference in the results excepting that the Woolfat excells the others in its adhesive qualities as the rain does not seem to wash that off as it does the other mixtures.

I watched my orchard of one hundred and forty acres as the season came and went and really I could see no difference in the sections which were sprayed, and those not sprayed.

The foliage was quite free from scab and remained on trees until late this fall.

The crop of fruit buds for the ensuing year is fair in quantity and they are well filled and healthy.

REPORT OF DIRECTOR OF THE TENTH DISTRICT.

L. A. CLEMONS, STORM LAKE.

I have prepared no written report and have only to report frozen hopes for the tenth district. We are, however, in hopes for better things in the future. I have no doubt but what in the southern district thousands of bushels of peaches will rot next season, and that in northern Iowa we will have more apples than we know what to do with.

REPORT OF DIRECTOR OF THE ELEVENTH DISTRICT.

CHARLES F. GARDNER, OSAGE.

All tree fruits were so badly injured by the heavy frosts while they were in bloom that there was no fruit grown in the district to my knowledge. All small fruit was the next thing to a perfect failure for the same reason, with the exception of Pan American and Autumn strawberries and their seedlings, which bore a good crop in June and continued to bear until it froze up Nov. 1. The plants I spoke of in my last report that we noticed the 6th of last October, being an original plant and eight runners has made good. The nine plants made five hundred and forty-nine runners, averaging sixty-one to the plant. The old plants were full of fruit all summer and all the runners were similarly loaded as fast as they got old enough, some bloomed before they were fairly rooted. They are a fine large berry of good quality.

The "King" red raspberry was also an exception and bore a good fair crop of nice berries. No other kind bore worth speaking of.

Native plums fared as bad as the tenderest varieties—all were killed. I say all, perhaps we had 15 or 20 plums in all and about the same number of poor inferior apples. The worst year I ever knew.

In my report last year I see the word "Panhandle"; it should be Pan-American.

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REPORT OF DIRECTOR FROM THE TWELFTH DISTRICT.

EUGENE SECOR, FOREST CITY.

You have heard the wail of the mourners from all over the state, and I don't purpose to entertain you with the same jeremiad.

I might tell you of the extra early spring that saved a lot of fuel and boomed the Iowa banana belt in a real estate way, till the optimist declared that the axis of this old world had changed, and that we should never again see sundogs chasing the major luminary across the northern heavens; but you already know how the early birds were lured away from their southern loafing grounds a month before the calendar time, and how their early songs were frozen in their throats, and I need not repeat that doleful story here.

I might mention the Manitoban wave that overwhelmed us on April 22d and 23d when the orchards were in full bloom and how it froze the blossoms as stiff as the wax flowers on a lady's hat, but I will not depress your spirits by a recital of the effects of that frigid reality on the cheerful dreams of a fruitful harvest.

I might mention how such hardy things as pieplant, peonies and phlox a foot high lopped over into the lap of winter as utterly disconsolate as Rachel of old, but this might chill the horticultural enthusiasm of the younger generation who believe things are what they seem to be.

If I told you of planting sweet corn and garden truck in March, in northern Iowa, you would probably want to know whether our insanity board was absent or ineffective.

And if I reported that the festive cutworm grew and prospered on the early garden stuff, and the ubiquitous aphis sucked the life out of the plum trees, and the oyster shell scale maintained its footing in the apple orchard, and the codling moth and curculio fattened on the remnant left over after the late unpleasantness, it might discourage some youthful enthusiast who thinks all one has to do to raise fruit is to plant the trees in the spring and provide barrels in the fall.

You might want to know why we didn't spray in spite of unfavorable weather. That's what we ought to have done; but you know how prone we are to discouragement, and how liable we are to think everything is ruined if it is a little too cold or hot, too wet or dry. Had we gone right along with all usual operations against the enemy we might have had more apples than we did. Quite a lot of Duchess and Wealthy survived all frigid conditions and attempted to reward us with enough fruit to keep our ribs from rattling against each other. It was noticed that trees in sod, and planted in the most exposed places had the most fruit, but owing to hot dry weather and insect ravages the apples fell early.

All early strawberry blossoms were killed but later ones produced some fruit. No nuts, no acorns, and squirrels are dependent on the bursting corn cribs.

Gooseberries, currants and raspberries were a total failure. Grapes were a pretty good crop.

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We had a minimum of rainfall during the growing season and almost continued sunshine and warmth, but no excessive heat. Grain crops of all kinds yielded a good average of exceptionally fine quality.

Notwithstanding all apparent unfavorable conditions in spring and summer the bees gave us the best returns in many years.

All hoed crops, properly cultivated, went through the dry period in pretty good condition. Tomatoes were never finer, and late potatoes and sweet corn paid well. The farmer is all smiles and listens wistfully to the siren voice of the automobile agent.

The catalogue houses are doing an increased business, and twenty-dollar bills are as common as continental scrip in Washington's time.

THE PRESIDENT: This completes the reports of the directors. We have some visiting members. The first gentleman to report is W. P. Bussey, Omro, Wis.

A REPORT FROM WISCONSIN.

W. P. BUSSEY, OMRO, WIS.

Mr. President and Officers and Members of the Iowa State Horticultural Society:

It is a pleasure for me to meet you in your annual convention and bring the greetings and good wishes of the Wisconsin State Horticultural Society.

When our president, Mr. Toole, asked me to act as a delegate to this meeting I objected on account of not being a horticulturist in the strictest sense of the word.

I want to say now, that there may be no misunderstanding hereafter, that I am just a plain every day farmer and that I am a horticulturist to the extent of furnishing our own family with some of the horticultural products that can be grown successfully on the farm for our own use.

The question of marketing does not trouble us to any extent, as we give away or exchange with the neighbors more of our surplus than we sell.

I say this in explanation, so that if I seem ignorant from a horticultural theoretical standpoint you should not judge all Wisconsin horticulturists by me, as I can assure you that we have them, the genuine, all wool, blown in the bottle, a yard wide and warranted not to do anything worse than to tell you how much better their particular kind of seedling is, than is any other seedling, or how much larger crops of strawberries they can grow, than any one else can.

But why enumerate their many virtues? A horticulturist is just the same anywhere you find one, either in Iowa, Minnesota or Wisconsin, and if they are not so easily distinguished as the proverbial farmer (with hayseed on his back), you find them a pretty good bunch of fellows and they all seem to be having a good time and incidentally getting rich.

Perhaps it might not be out of place for me to say that I ought to be interested in horticulture in Iowa as my father canvassed eastern Iowa

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over 40 years ago for the Moulson Brothers Nursery of Rochester, N. Y., and if that nursery stock did as well with you as it did in Wisconsin some of the apple trees that he sold may still be alive and bearing fruit.

Your Secretary has assigned me the paper, "A report from Wisconsin."

Perhaps not in years (if ever) did the fruit crop promise better than it did with us in the early spring of 1910.

I do not know that I ever remember seeing the foliage start out better or the trees blossom fuller than last spring. The fruit grower looked ahead, saw visions and dreamed dreams and wondered how he could ever handle such a crop or what he would ever do with the money. But, alas, along about April 20th we had a change of temperature. The morning of April 23d we had about four inches of what some poets call "The Beautiful." It might have been beautiful to a poet but to a plain farmer with his orchard in full bloom, strawberry bed uncovered, his grain all sprouted and out of the ground, it looked like a "frost" and a frost it certainly was. For several days it furnished the main topic for conversation. Ten days or two weeks later we had a severe frost that nearly finished what the first one missed. Notwithstanding all though there were a good many trees that had apples on them and if we had had the usual amount of rain during the summer as we generally have, we should have had a pretty fair crop. But with the drought, unusual for Wisconsin, lasting through June, July and August what was "missed going was caught coming." So that with a very few exceptions (favored situations) Wisconsin probably had the smallest fruit crop that it has had in years. Some of the oldest exhibitors at the Wisconsin state fair stated that the fruit exhibit at the fair last fall was the smallest in its history. But never mind, a bright new year is just before us. Already the seed firms are sending out catalogues, nurserymen their life size pictures of fruit nicely colored and hope springs eternal in the human breast and we look forward to a happy future in our chosen occupations, forgetting some of the mistakes we have made and the misfortunes that have come to us and remembering the many days of sunshine and gladness and the blessings that have been ours.

With kindest wishes for the success of the horticultural society in Iowa I extend to you a cordial welcome to meet with us in our annual meeting next month.

THE PRESIDENT: We will now hear the delegate from Minnesota, Mr. Charles Haralson.

NOTES ON FRUIT-BREEDING FARM.

CHAS. HARALSON, EXCELSIOR, MINN.

Three years ago the state of Minnesota purchased eighty acres of land to be devoted to an experimenetal fruit breeding farm. This farm is operated in connection with the University and experiment station, under the direction of the Horticultural department, also the Horticultural So-

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ciety takes an interest in the work which is carried on at the place.

This fruit breeding farm has been in operation only three years. A lot of preparatory work was necessary before plant breeding could be taken up, but the progress made during the past three years has been exceptionally good.

The object of this farm is for breeding and improvement of fruit, in the orgination of varieties by selection, and crossing. At the present time there is a clamor for fruit of better quality, more hardy and disease resistant, than some of our commercial varieties are at present. This is an important subject, and it is one that is demanding very serious consideration. We are growing a large number of seedlings, which are the results of crosses of certain varieties which, it is thought may possess the desired characteristics for a variety particularly adapted to this section of the country. It is realized that much work has to be done before the desired results are obtained, but if such variety should be produced it will be of inestimable value to the fruit growing industry of the northwest.

The work is carried on in several different lines, our native fruits are crossed with the large size and high quality fruits of this country and Europe. The object of these experiments is to combine hardiness of our native quality, size and productiveness of the commercial varieties, with the hope to get some varieties more suitable for this locality.

In our Minnesota climate the condition in spring is very unfavorable for plant breeding, we have done a great deal of cross pollination every spring, but obtained very poor results. From the first it is a slow process, every blossom has to be bagged after emasculation and next day to be removed, to apply the pollen and bagged again to keep foreign pollen from the blossom, all these necessary operations take a great deal of time and labor.

The plant breeding season is very short, consequently very little can be done, unless a large force of expert men are employed to do the work, and then, very little is accomplished unless conditions are favorable. Our plant breeding is done mostly under glass, which gives satisfactory results, climatic conditions can be controlled in the greenhouse, and gives us from five to six months plant breeding season. You can readily see the advantage of doing the work under glass, no bagging of blossoms is necessary as there is very little chance for foreign pollen to interfere with perfect work. We have a greenhouse 18x100 which is entirely devoted to plant breeding, trees are budded or grafted on dwarf stock, such as Paradise for apple, and western sand cherry for stone fruits, the trees are grown in pots or tubs, and handled like you would pot plants. A plum tree 5 to 7 feet high, if in good condition will mature as much as one hundred fruit. In fall, before cold weather sets in, the trees are repotted and stored away in ordinary cellars built for this purpose, later on to be taken to the greenhouse. The plant breeding commences with the strawberries and raspberries which will be in full bloom about January first, from that time trees are taken from the cellar to the forcing house every week, up to the time the trees are through blooming outside in the spring. The work of breeding strawberries and raspberries was first taken up,

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because they give results quicker, we have fruited over 25,000 seedlings and 10,000 more to fruit next spring. The results of crossing our native, the wild of Alaska and Northern Norway, with the best varieties we have been able to obtain in this country and Europe. Some 900 seedlings have been selected from this lot, for testing further, later on to be weeded out to just a few varieties.

Improving our native by crossing with the European, California and Japanese plums, we find the Japanese gives us the best material to work with, a large number of promising seedlings are growing at the fruit farm now, the results of such combinations. Some new valuable varieties will undoubtedly appear in the near future.

A great deal of work is carried on to improve our grapes by growing seedlings from the better grape, and crossing the better grape and the wild grape, with the best commercial varieties. We fruited about 400 Beta seedlings last summer, which gave us very much encouragement to keep up the experiments. We do not hope to be able to compete with the grapes, which are grown in the grape growing regions as to quality or size, but we will be able to introduce new varieties, which will be hardy in our climate, without winter protection, with quality good enough for our local needs.

We have planted an experimental plant breeding apple orchard of about 600 trees, budded on paradise apple root. When one year old trees, they are bent down, and tied to a stake set down by each tree or to a wire trellis, to keep the trees growing close down to the ground. We have trees two years old growing in this way, with quite a number of fruit buds and with favorable conditions will fruit as three year old trees. The trees are planted eight feet between the rows and four feet in the row. The advantage of growing the trees in this way is for the first, you will not have to climb large trees where wind and other conditions make in inconvenient to do plant breeding outside. Second, a small tent can be used to work under which gives protection from the wind. Third, the tender long keeping, and high quality varieties of the east, can be protected like one would protect raspberries during winter, by covering them with earth, where otherwise we would not be able to grow them except in tubs.

THE PRESIDENT: We will next hear the report from Illinois, by A. V. Schermerhorn, Ridgefarm, Ill.

REPORT FROM ILLINOIS.

A. V. SCHERMERHORN, RIDGEFARM, ILL.

Ladies and Gentlemen of the Iowa Horticultural Society:

I am sent to you as a delegate from the Illinois Horticultural Society and the Illinois Farmers Institute, and as such I express to you their greeting wishing you success along all the lines covered in your work for a better horticulture.

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On your program you ask me to report horticultural conditions in Illinois. I want to say on the out start it is too big a job for me to cover the whole field. I will give you part however I know something about.

Commencing on the commercial side and the king of fruits, the apple, will say, in all my experience we had to meet conditions this year that was not a duplicate of any previous year I have any recollection of. The unusual conditions were beyond the power of man to control to save the fine prospect for an abundant apple crop all over the state in general. Some few sections were favored by a less rapid falling of temperature and not reaching the point of ruin. Portions of Crawford, Lawrence, Jasper, Wabash, Richmond, Clay, Wayne, White, Gallatin, Johnson, and Saline counties harvested fair crops of apples from orchards that were carefully sprayed and cared for.

Senator H. M. Dunlap, especially, harvested satisfactory crops, from a yield and quality standpoint, from his orchards in Richland, Wayne, and Clay Counties. It should be understood Mr. Dunlap sees to it that his orchards are properly sprayed and cared for. What Senator Dunlap is doing anyone with good common sense can do if he will inform himself how and adopt an economical, practical system of operation. I speak of this hoping it may inspire you to study the underlying principals of apple production which must be well enough understood to adjust same to get the desired results under your local condition.

Most all fruit crops in Illinois, except strawberries, were more or less a failure the past season.

Just a word from the Illinois Farmers Institute side that covers the whole field of agriculture. All farm crops the past season gave satisfactory yields with the usual individual differences of the farmer.

For example, a man on one side of a certain road had a yield of corn last year of 89 bushels per acre, a man on the other side of the road 33 bushels per acre, these same fields were followed with oats this year, the man that got 89 bushels of corn last year had a yield of oats after the corn of 96 bushels per acre, the man on the other side of the road had a yield of 31 bushels per acre.

A man in Hancock county husked 114 bushels of corn per acre, the average over the county was about 30 bushels per acre.

There is something in knowing how to raise crops as well as anything else. There is no danger of anyone learning too much about his business.

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TUESDAY AFTERNOON SESSION.

THE PRESIDENT: The society will please come to order.

MR. GARDNER: Before proceeding with the regular program, I move you, that Mr. W. P. Bussey, Mr. Charles Haralson, and Mr. A. V. Schermerhorn, the delegates from Wisconsin, Minnesota and Illinois, respectively, be made honorary members of this society.

MR. BLODGETT: I would add the name of Rev. J. F. Jamieson, and then second the motion. (The motion was unanimously carried.)

THE PRESIDENT: On behalf of the society, I welcome these gentlemen and hope you will become one of us in spirit as well as in reality while you are here.

The regular program has for its first number the subject, "Spraying," by G. R. Bliss, of Ames.

SPRAYING.

PROF. G. R. BLISS, AMES.

There is a widespread lack of information upon this subject by those who need to be familiar with all of its details. Only a very small percentage of farmers or gardeners or even of orchardists have ever attempted it. This is partly due to neglect, partly to a lack of time and partly to a reluctance towards attempting something not thoroughly understood but entailing considerable expense and a possibility of failure.

Were the grower of fruits and vegetables in the state to do but one thing in order to increase his yields and profits, it is doubtful if he could do more wisely than to start the practice of thoroughly spraying his trees and vines. The annual losses to the fruit and vegetable crop through damage by insects and diseases is enormous. From year to year these pests seem to be gradually growing more numerous and troublesome. Hardly an economic plant is cultivated which hasn't many foes of this sort.

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Apples cannot profitably be grown without spraying. The apple worm annually eats or destroys more apples than do all the boys of Iowa. The grape crop of Council Bluffs and vicinity in 1909 was reduced from 100,000 to 55,000 baskets by the black rot and downy mildew. Potato blight is quite prevalent and causes heavy losses almost every year. Anthracnose has almost ruined the black raspberry plantations all over southern Iowa. The cabbage worm probably destroys one-half of the cabbage plants put out every year. The slug skeletonizes the plum and cherry trees almost annually. The curculio and brown rot have prevented the plum grower from getting returns for several years.

The following table gives the results of spraying in a number of different states. This is all experimental work conducted by the experiment stations.

Year	Place	No. trees in experiment	Ave. yield per tree		Gain from spraying
			Sprayed	Unsprayed	
1906	Rockford, Iowa	54	1.85 bu.	.25 bu.	1.6 bu.
1907	Rockford, Iowa	8	1.7 bu.	.45 bu.	1.25 bu.
1907	Arlington, Nebraska	30	4.0 bu.	1.9 bu.	2.1 bu.
1907	Amherst, Ohio	49	21.4 bu.	10.0 bu.	11.4 bu.
1909	Urbana, Illinois	4	12.0 bu.	2.5 bu.	9.5 bu.
1909	Griswold, Iowa	6	2.15 bu.	.82 bu.	1.23 bu.

In Nebraska the cost of spraying totaled $.29 per tree and the net profit was $2.57. In Ohio the cost reached the high figure of $.57 per tree but the profit from spraying was relatively larger, being $6.28 per tree. This emphasizes the value of thorough work.

Potato spraying has likewise proved very profitable when done by the experiment stations of a number of states. The following table tells the story.

State	Duration of Exp.	No. acres included	Av. increase per acre from spraying	Av. cost of spraying	Av. net profit per acre from spraying
New York	1902-08	*	84 bu.	$ 5.00†	$ 45.55
New York (Business Exp.)	1903-08	96	44 bu.	4.93	17.98
New York (Vol. Exp.)	1904-06	1707	50.5bu.	5.00†	25.84
Vermont	1892-08	*	112 bu.	5.00†	39.80
Wisconsin	1905	30	90 bu.	3.70	32.30
Minnesota	1908	3	16 bu.	2.56	5.34
‡Iowa	1909	*	17½ bu.	5.00†	3.75

* Small plots.
† Estimated.
‡ In the Iowa experiment the unsprayed rows were dusted to kill beetles so that the difference is due chiefly to blight. Since blight was not serious at that time the increase from spraying was small.

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These figures are all final averages. It is especially worthy of note that the average increase was 112 bushels per acre in the Vermont experiments. As these ran through a period of 18 years this is a remarkable record and is conclusive evidence that spraying pays.

One of the greatest problems of the apple grower as well as he who raises plums and peaches is the control of the curculio. In the past spraying was regarded as practically valueless in destroying this insect and the curculio catcher was recommended. Recent experiments have shown that the curculio can be quite well controlled by spraying, provided the work is done thoroughly at the proper time. Of course, clean culture is the most practical means of handling this problem. When the orchard is permitted to become sodded there is invariably trouble with this insect. In some cases 95 to 100 per cent of the apples will be gnarled and blemished by curculio stings. An orchard which is cultivated and clean will seldom be infested to any serious extent. In an Illinois orchard 90 per cent of the apples from unsprayed trees were damaged by curculios. Five applications of Bordeaux mixture with three pounds lead arsenate reduced the percentage of injured apples to 62 per cent.

In southern Iowa and Missouri where peach growing is given considerable attention the curculio and brown rot commit heavy depredations. The foliage of the peach is so tender that Paris Green cannot be used. Self-boiled lime-sulphur has been tried but it frequently discolors the fruit, especially when applied late. Curculio catchers are only partly successful and often impracticable in commercial orchard. The Missouri Experiment Station took charge of a large peach orchard in the Ozarks in 1908. Three sprayings of lead arsenate, one pound to 50 gallons water were made on part of the trees. The unsprayed trees showed practically every peach injured or completely worthless because of curculio. On the sprayed trees only 6 per cent of the fruit was touched by the insects. The spraying heightened the color of the fruit very materially and in preventing curculio wounds it reduced the damage by brown rot very much since this disease usually finds entrance through insect bites. There is a great deal of misunderstanding about the relative cost and efficiency of Paris Green as compared with homemade and commercial lead arsenate. The following table brings out these comparisons. Arsenious oxid is the desirable substance in these preparations. The amount of this compound together with the degree of freedom from injurious materials in solution determines the value of the article as an insecticide. The Commercial Lead arsenate is taken as a paste (50 per cent moisture).

Arsenical	Amt. used in 50 gal.	Price per lb. wholesale	Per cent Arsenious oxide	No. of grains arsenious oxid in 50 gal. spray	Cost	No. of grains arsenious oxid for $1.
Paris green	¼ lb	$ .20	.55	802.124	.066	1243 g
Com. lead arsenate	½ lb	.10	14.5	129.92	.20	649.6 g
Com. lead arsenate	3 lb	.10	14.5	194.88	.30	649.6
Home made lead arsenate	1 lb	.11½	.32	143.36	.115	1247 g

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The amount of arsenious oxid is expressed in terms of the metric system. One ounce is equivalent to 28 g.

It can be seen by the above table that homemade lead arsenate is about the same price as Paris Green while commercial lead arsenate is nearly twice as high. In price per pound it is about the same as homemade product but it must be remembered that it contains approximately 50 per cent of moisture as it usually comes as a paste. The cost of the home made product is computed on the water free basis.

Lead arsenate is supplanting Paris Green as an insecticide. While arsenate of lead is higher in price it is more effective than Paris Green and sticks to the foliage longer. It is easier to estimate the thoroughness with which a tree has been sprayed because the lead arsenate is white in color and shows plainly on the leaves. Two pounds of lead arsenate to 50 gallon of water has been found practically as effective as three or larger amounts for apples or potatoes. It is best to use only 1 1-2 pounds in spraying peaches the first time and reduce this to one pound in later sprayings. Add 2-3 pounds of stone lime to every 50 gallon of the spraying material as a protection to the foliage.

THE PRESIDENT: This subject is now open for discussion.

MR. SPENCER: That chart of yours shows conclusively that spraying without some arsenical preparation does not control the coddling moth.

MR. BLISS: Yes, sir; that is true in practically all these cases.

MR. TRUE: I see where you use three pounds of arsenate of lead, you only get 2 per cent greater results than where you use the two pounds.

MR. BLISS: That is a good point. They have been experimenting with two pounds and three pounds, and the general conclusions have been that two pounds of lead arsenate will give about as good results as three.

MR. SPENCER: Isn't it a good plan to put on enough; if there is any benefit, let us put it on.

MR. BLISS: Sometimes the lead arsenate we get may not be as strong as it should be.

MR. BLODGETT: You have more money there where you use two pounds than where you use three pounds?

MR. BLISS: Yes, that is true. Of course, there are liable to be variations we would hardly think would occur. Sometimes things show up in an experiment differently than what they really are.

PROF. GREENE: The variation in price there depends a good deal on the trees you have.

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MR. BLISS: Yes, the variation as to the individual trees.

MR. SPENCER: You have lime quite a bit too low. We cannot buy lime in our section of the state for less than $1.50 a barrel.

PROF. BEACH: On the other hand, you can buy copper sulphate now quite a little cheaper than it is given there.

MR. SPENCER: That four or five times spraying is simply because they do not spray right at first.

MR. BLISS: Mr. Simons does not agree with you, Mr. Spencer. I think some of these western experiments were misleading. They got some of the men in the east instilled with the idea they would only have to have two sprayings. Of course, any such argument as that will appeal to us naturally. As a general thing, I think we had better be on the safe side and not forget the second brood of the coddling moth. The second brood will not be so injurious, but there will always be a certain amount of it, and they do more damage than you think for.

MR. MOFFETT: What do you think of the effect of the dry season on the insects?

MR. BLISS: Well, the insects will do well enough if they have enough to feed on. I suppose they will be less numerous.

MR. BLODGETT: There isn't a plum, or peach or apple for them to propagate in. Where will be the brood for next year?

PROF. GREENE: I remember in New Mexico one year it froze nearly all of the fruit, and they took particular pains to inspect every box of fruit that came in, and yet, in 1909, the year following, the crop of coddling moth was just as bad.

MR. TRUE: How do we determine the proper time for spraying for the second brood?

MR. BLISS: The second brood drags out much more than the first. That is hard to say. They come on sometimes for two, three and four weeks. Sometimes, I think, it is necessary to spray twice.

MR. MOFFETT: If a man had his chickens in the orchard during the season, would that have any effect on the worms?

MR. BLISS: I think it helps quite a good deal to have poultry around, and pigs.

MR. HARRINGTON: This is a question that has bothered me quite a good deal. I find there is a great variance in the different

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seasons as to the time for spraying for the second brood. The only way I could determine would be to examine the fruit carefully from time to time, until you find they are emerging from the apples, and then you can begin your spraying. I find a variation of three weeks in our orchard, one year with another. The first year I was intending to spray, I thought I would begin about the first of August. When I got ready and started to spray, an examination showed that I was about ten days too late that year. The next year I thought I wouldn't be behind time and I made careful examinations and waited nearly three weeks, and I sprayed soon enough at that time. You must carefully examine and when you find it is about ready to emerge, then is about the time you should start your spraying.

MR. BLODGETT: I have had a little experience with putting bands around in June and examining those bands and smash the worm, and I found worms every time I examined it, from June until October. I think they are coming on all the time during the entire summer. There may be times when there is a greater number than at others.

MR. SPENCER: I do not think that a man can cover a fair sized tree four or five times a year with 15 gallons. It takes six gallons to a tree of mine in one coat; I cannot cover it thoroughly with less than six gallons. I do not think you would get a very thorough application.

MR. BLISS: That is perhaps one of the secrets why you only need to spray twice.

MR. SPENCER: It is an easier matter to spray well while you are at it.

MR. BLISS: I think we want to do the work earlier and do it three or four times.

MR. MOFFETT: In mixing Paris Green, is it not more difficult than the other mixture, to get it even?

MR. BLISS: Yes; that is one of the reasons arsenate of lead will be used as a general thing; arsenate of lead will give a much better result, while the Paris Green is likely to injure the foilage, especially on trees of tender character, such as the Japanese plums and peaches.

A MEMBER: How do those sprays effect the honey bee?

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MR. BLISS: They effect it quite unfavorably if put on when the trees are in blossom. That is not the time to spray; however, spraying should be done after the petals fall and within seven to ten days after. That is one of the important precautions—do the work in season.

MR. SPENCER: Just one word about the time of spraying. The essential spraying I think is the first spraying. If I could spray all of my orchard the day that the pinks show on the blossoms, that is the day I would spray.

MR. BOMBERGER: My experience is that the first spraying saves a whole lot of your crop from fungus getting on the stem. That first spray, just when the pink shows, is the spray. There are a lot of blossoms destroyed by fungus right at the start.

MR. SPENCER: I want to say with this subject, that the most successful crop I have raised I used Paris Green. There is no danger of doing any injury. A little Paris Green can be very cheaply applied, and I always give it the benefit of the doubt and use a little.

MR. HARRINGTON: I think that spray at that period is about as beneficial as any you can apply for the curculio. There is very scant foliage at that period and they are usually on hand. My impression is, from my observation, that we want to spray just prior to the blooming period, and that spray will more effect the curculio than any other.

MR. TRUE: As I understand it, that is as soon as the pink shows on the blossom?

MR. BLISS: Yes, sir.

MR. SCHERMERHORN: May I ask if you are troubled with the canker worm very much in this state?

MR. BLISS: To some extent; not very much.

MR. SCHERMERHORN: That is an opportune time to catch the canker worm.

THE PRESIDENT: We are now going to have a series of papers on a live question, that of "Orchard Heaters." I believe we had better have those three papers and then you will be let loose in the discussion.

The first is entitled, "Fighting the Frost in Orchards," by F. P. Spencer, Randolph.

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FIGHTING FROST IN THE ORCHARD.

F. P. SPENCER, RANDOLPH.

The above subject was suggested to me by your secretary as one that might be proper to use as a preface to, or I might say a starting point, from which various digressions might be allowed, along the line of thought suggested by the title.

In this instance the frost to be fought and conquered (possibly) is not the one that is wont to prevail at certain seasons in this cold, north country, nor of that class so graphically described by James Whitcomb Riley as the one that descends upon the pumpkin, putting finishing touches upon that delectable fruit, but rather one of that heart depressing varieties that is disposed at certain inopportune times to descend upon the head (and fruit trees) of we optimistic fruit growers, and by its destructive effects change, as it were in a moment, our fond anticipations of bounteous yields, to total failures.

Various methods are used to protect the tender buds, blossoms or apples in embryo from this destructive agent. At this time the one most in use is a pot or vessel of some design, in which to burn fuel oil. There are a number of different designs of these fire-pots or orchard heaters now on the market and the patentee of each one is very sure that his particular design has all the merits with none of the demerits of the others.

—A sketch from my personal experience might not here be amiss. During the winter of 1909-1910 I bought 2,500 of what is known as the Troutman Orchard Heaters. About 2,200 of these proved by test to be sufficiently tight to hold fuel oil. Relying upon what information was at my command, I placed them at about the ratio of 85 to the acre, that amount being ample, as per published estimates of the patentee, to successfully resist any frost conditions liable to prevail in the danger period in the latitude in which I live.

I was confronted with very unusual weather conditions last spring. The unseasonably warm weather in March caused the apple trees to blossom 36 days earlier than the previous year. This was followed by much colder weather in April, culminating on the night of April 16-17 with high winds and snow flurries, thermometer registering at low point, 24 degrees. As stated above, I had my pots out and filled with fuel oil, ready to light. But alas, there is always a "fly in the ointment" and this case proved no exception. All former experiences had lead me to believe that at this period of the year there was no frost danger *until late in the night* and then only when there was *no wind*. As the heaters held enough fuel to burn 5 to 6 hours, everything seemed lovely. This particular night registered a temperature of *28 degrees at nine o'clock* which necessitated our firing up at once. But here was the question in front of us—there appeared to be at least 10 hours of continuous heating ahead of us, with not to exceed 6 hours of fuel available—it being practically impossible to refill that number of pots during the night. This left three propositions before us for consideration, viz.: First, to abandon the field; 2d,

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light all the fires at once, and know that along about two o'clock A. M. (the coldest period of the night) the fires would go out; 3d, light one-half the pots at once, the remainder a few hours later, thus insuring a continuous fire during the night.

We chose this third alternative it resulting in making some smoke and (apparently) less heat, so that when morning came we had succeeded in burning about 2,200 gallons of fuel oil and lost a nights' sleep. The result showed a reversal of conditions existing the day before. My abundant promise of 20,000 bushels of apples now indicated 00,002 bushels.

I am not ready to abandon the field to King Frost but rather class myself with others that have attended that dear school, experience. My tuition being paid in advance, will try another term, endeavor to profit by past failures and score such future successes as may be. Have no doubt that with pots enough, the damage to orchard fruits may be eliminated.

I am not interested in the sale or use of any of the numerous heaters now offered, nor do I desire to be so understood. After last springs disastrous experience I have been looking around to find some heater with more oil capacity as well as with some method of control of the area of burning surface, at the will of the operator. I have with me a Troutman, also a Hamilton Pot. A trial has proven to me that the Hamilton embodies, to a considerable extent, my ideas of a good heater. Its valuable features are; nearly three times the oil capacity; also a very simple device to govern the amount of fuel consumed, it necessarily following that more or less heat may be created as the exigencies of weather may require. The more or less specious claims made by some heater patentees that their particular heater consumes less oil for the same amount of heat generated, lose force when one considers the possibility of losing a 20,000 bushel apple crop by frost (as was the writer) and fuel oil is too cheap to hardly enter into the real cost of fighting frost. It is but little more work to fill a pot with 3 gallons of fuel oil than one holding 5 quarts.

The valuable features—if any—in a discussion of this sort can be best brought out by the participation in it by many. I welcome, and will take pleasure in answering all questions to the best of my ability.

Unusual weather conditions prevailed in the section where I live. A line drawn east and west at a point 25 miles south of me, would show within a limit of 5 miles distance, a full crop of apples south and a total failure north. Similar conditions existed in same latitude in Nebraska. My attention being called to this remarkable phenomena I made an investigation, finding one orchard within this 5 mile zone with a full *half* crop of apples, the owner insisting it was saved solely by the use of orchard heaters. Another orchard within 3 miles, with same general varieties, bore a *full* crop without *any heat* or artificial protection whatever. I mention these conditions to show the possibility of lack of proof attending the claims of interested parties as to the efficacy of orchard heating. The comparison above quoted is a matter of common knowledge to residents nearby. Perhaps it is better to know less about orchard heating than to know so much that is not true.

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THE PRESIDENT: The next subject on the program is "Counteracting Frost Injury With Orchard Heaters," by Rev. John P. Morley, Marengo.

COUNTERACTING FROST INJURY WITH ORCHARD HEATERS.

JOHN P. MORLEY, MARENGO.

The greatest enemy to fruit in Iowa is Jack Frost. And the next is general neglect. This year practically all the fruit trees of Iowa are mere cumberers of the ground. And because our fruit crop is so uncertain many orchards are neglected, unpruned, unsprayed, uncultivated. So that when the favoring year does come, and the frost damage is at a minimum they cannot grow the crop that might have been grown with proper care. Once when I spoke to a farmer about the care of his orchard he replied, "Oh, I can raise more apples with a five dollar bill at the grocery store than I can get from that acre of trees." Possibly his statement was true, considering the care the orchard received. Yet if he had intelligently spent the five dollars in the orchard he would have received it back many fold.

And now since frost is the greatest enemy to fruit in Iowa it will be worth while to give first attention to the fight against its damage. In this endeavor orchard heaters have passed beyond the merely experimental stage. Their practicability has been demonstrated in many localities. They have been used extensively and for some time in California and on the north Pacific coast. Perhaps their greatest success has been scored on the western slope in Colorado. There in many localities, 80 per cent of the orchards are equipped. I have visited at Grand Junction and Palissades and have seen the orchards with loaded trees where the heaters had been used, side by side with other orchards with barren branches where the heaters had not been used, and it was a demonstration not to be mistaken. Heaters are being introduced more or less extensively in the Yakima and Wenachee valleys in Washington and in many other fruit regions of the northwest. At Hood River, Oregon, and a few other places they profess not to have need for heaters. Whether this is strictly true or is simply for advertising purposes I am not advised. Certain it is however, that we need protection in Iowa.

Many, knowing of the success in frost fighting in other localities, still have deemed it impractical in Iowa. It has been assumed that because of our winds or our low temperatures after blossoming time that here we were at the mercy of the frost pranks. But the weather records will show that we do not have more degrees of frost to overcome in Iowa than in other regions where there has been success in saving the fruit.

And the handicap of wind, in the fight with frost, has been overcome. Mr. G. B. Bracket, Pomologist in the government service, reports in the Agricultural Year Book for 1909, that on April 29th of that year, at Canon City, Colorado, there was a terrible blizzard; the wind blew a gale and

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there was eight inches of snow, yet in the midst of these conditions the temperature was raised by means of heaters, from 21 degrees to above the danger point. Conditions more unpropitious than that would be rare in Iowa. If our orchards had groves of pine or other windbreak it would be a help in the use of the heaters, but the wind is not an insurmountable difficulty in using heaters. And the fact that in this most extreme year of early blossoming followed by severe freezing certain Iowa orchards were saved by heaters and have a good crop in this year of fruit dearth, would seem to demonstrate the practicability of the matter beyond question.

As our orchardists begin to turn their attention, as they certainly will, to this means of insuring our fruit crop they may well profit by the experience of those who have led the van in the fight against frost. This experience has brought to the front a variety of heaters, using different fuels. The questions of fuel is an important one. In some places where wood is abundant, open wood fires, burning on the ground are used. This eliminates a large part of the cost but requires extra labor to keep the fires burning evenly and to prepare the wood for the fires. And then, with us, there might be a rain or snow just before the fires were needed and make it difficult to kindle the fires. If some one would devise a good, cheap wood burner it might be advantageous in regions where wood was cheap. Or if some one would invent a successful, reservoir cob burner, that might solve the fuel question in this great corn state. But at present it would seem that we must choose between coal and oil as a fuel.

The relative cost of these two fuels will be determined by the proximity of coal mines. In some portions of the state coal will be cheaper and in other portions oil will be cheaper. In using coal a good quality of bituminous nut coal has been found to give the best results. Various grades of crude and distilled petroleum have been used successfully. Perhaps the best oil for the purpose is a distillate fuel oil of between 20 to 30 gravity. This can be bought in car lots for less than three cents per gallon. It has been estimated that 100 gallons of oil will produce as much heat as a ton of coal. From this estimate one may calculate which will be the cheaper fuel for his locality. It will require more labor to handle the coal and to lay the fires than in the case of oil, but a tank to store oil will cost more than a shelter for the coal supply. Where there is not much difference in the cost it will perhaps be better to use coal in the small family orchard and oil in the commercial orchard.

Some attempts have been made to use smudge fires, depending on the cloud of smoke to ward off the frost. But it has been found that smoke alone will not suffice for more than a degree or two of frost. But when smoke can be had it may be a help to conserve the heat generated by the heaters. And if the smoke is continued in the morning it may shield the buds from the sun and so save them even if there has been some frost, whereas they would perish if subjected to the direct rays of the sun while still in the frost. But the smudge can only be regarded as an accessory and not even a necessary accompaniment to the work of the heaters.

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Experience in various places has shown that a large number of small fires is better than a fewer number of larger ones. The heat is better distributed and there is no danger of scorching nearby boughs. About eighty heaters to the acre is considered sufficient. With only a few degrees of frost not all of these would need to be lighted.

A part of the equipment will be a supply of accurate thermometers for different parts of the orchard and as well for observing the trend of the temperature outside the heated area. And it will be well, since the danger will come in the night, either to have an automatic frost alarm to give warning when the thermometer is near the danger point, or to have arrangements for warning by telephone or otherwise, so as not to be caught napping at the critical time. It is well also to make a study of weather conditions and probabilities so as to anticipate the turn the temperature will take during the night. This is not as impossible as it seems even here in Iowa. A considerable help in this direction may be had in the "Farmers' Bulletin No. 401" from the Department of Agriculture at Washington.

The knowledge of the weather probability will often determine whether to start the fires or not. Some will say to start the fires whenever the thermometer registers 32. But this is a rule with a wide margin. For no fruit, even in its most susceptible stage is injured above 31. But it will be well to take note of the weather conditions even before 32 is reached. If the drop has been slow and if it be near morning, or if it be cloudy or if for any reason it seems that the limit of the cold is at hand it may not be necessary to start the fires at 32. But if the indications are that there will be a further considerable drop it may be well to start the fires before 32 is reached. For it has been found that it is much easier to maintain a temperature in an orchard while the temperature outside dropped than to raise the temperature once it has gone down.

The cost of such frost prevention is something that all will wish to consider. This of course will vary with the locality, fuel and equipment used. The sheet iron heaters for oil or coal will cost from $16 to $20 per acre. A frost alarm, if provided, would cost about $20. The fuel for an average Iowa Spring would perhaps be about $5 per acre; and the average labor would be three or four days and nights for one man for five acres. One man under favorable circumstances might care for more than five acres, but for larger orchards additional help ought to be provided. But the equipment will last for a number of years and the cost would be small as compared with the value of the crop saved.

If the fruit raisers of Iowa should unitedly enlist in this fight against the frost, and should do their work intelligently and thoroughly as it must be done to insure success, the orchards would not only repay all that was spent on them but pay millions of profits every year. And all who aided in the work would have the blessings of a fruit hungry people.

THE PRESIDENT: The next is "The Progress of Orchard Heating in the Mississippi Valley," by Prof. Laurenz Greene, Ames.

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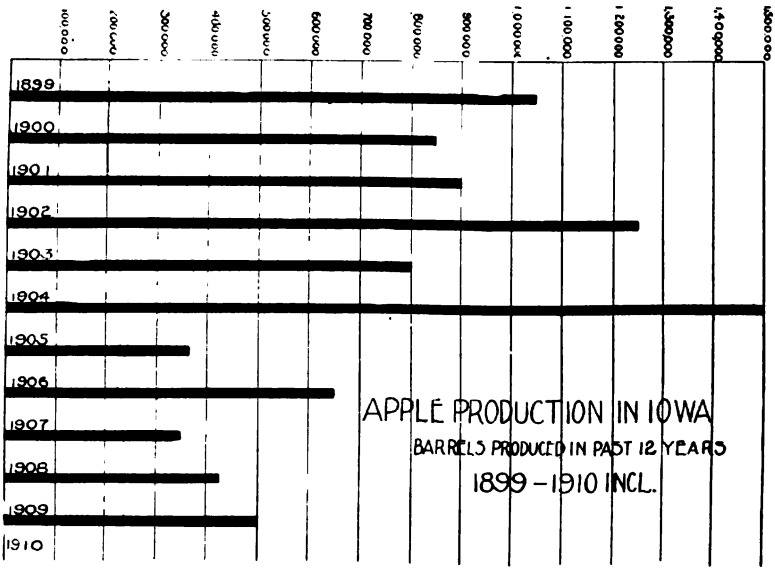
THE PROGRESS OF ORCHARD HEATING IN THE MISSISSIPPI VALLEY.

PROF. LAURENZ GREENE, AMES.

That there is no fruit growing region in the United States which is absolutely free from danger of late frosts is an established fact. From Canada to Mexico and from the Atlantic to the Pacific the fruit growers have suffered immense losses from the ravages of late spring frosts and freezes. Frost is a greater menace to successful fruit growing than all the blight, codling moths, scale insects and wind and hail combined. It has long been the one unconquerable foe and when a successful method is found for its control, the up-to-date orchardist will not be slow to avail himself of that which will insure a profitable crop of fruit every year. It will place him in position to overcome all difficulties with the exce-



tion of wind and hail. Insect pests and diseases have ceased to worry our latter-day fruit grower and I believe the day is in sight when frosty nights will hold no more terrors for him than do these pests which he controls with a spray wagon.

Probably no section of the United States has suffered greater loss from late spring frosts than has our own Mississippi Valley.

I wish to call your attention to a chart of apple crop statistics for Iowa: In the past 12 years, including 1910, with a maximum yield in 1904 of 1,500,000 barrels, we have had three crops of apples amounting to more than 1,000,000 barrels. In the past 6 years, we have not had a single yield of over 60 per cent of that. If our apple trees from 1899 to 1904

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could produce over six millions of barrels of apples and yet in a like period since produced only a little over two millions, our state has lost from five to ten million dollars from frost alone. We should have many more bearing orchards today than in 1904. According to statistics the crop of 1909 was about one-third as large as in 1904 and yet its value was in the neighborhood of one and one-quarter millions. Compare that with the value of our 1910 crop and we can see how great may be our loss from frost. To make this still plainer, let us take Fremont and Mills counties where we have the largest acreage of orchards in the state. The value of their crop last year was between $250,000 and $300,000 for the two counties. This year, barring Mr. Mincer's orchard where heaters were used, the total value would fall far below $3,000. All of this loss is due to one agent, that of frost, alone. The loss of fruit any one year since 1904 would pay for the installation of orchard heaters in every commercial orchard in the state.

With this immense loss staring them in the face, the growers of Iowa and surrounding states have watched with interest the successful fight against this enemy in the far west. Many have accepted the possibilities of orchard heating as no longer in question and some have equipped their orchards with heaters, with what success I hope to show you a little later.

There is another class of growers just as up-to-date so far as spraying, pruning, packing and other cultural methods are concerned as are these heater brothers, who hesitate to put their money into an experiment so expensive as this. These men are familiar with the success of the western growers and have anxiously studied their reports, but they have serious doubts whether methods that succeed in the inter-mountain regions will prove equally successful under such widely different conditions prevalent in the plains country.

Let us consider some of the differences in conditions between the two regions and afterward see what hope we have of combatting King Frost here. In this mountain country frost injury usually occurs on still nights. Compare conditions like these with our April freeze of 1910 and no comment of mine is necessary. However, the Grand Junction growers successfully fought a freeze with the wind at thirty miles an hour and with a blinding snow falling.

Most mountain valleys are protected by the surrounding hills or mountains. In the Grand Valley of Colorado, from which we have heard most relative to orchard heating and from which most of the orchard heaters now on the market have been patented, there is a very large area planted to orchards. These orchards occupy a large percentage of the total area of the valley and most of them are equipped with orchard heaters. Such conditions even with a high wind with all orchards and the same level are far different from those of an Iowa orchard on the top of a northwest exposure where the trees get the full benefit of a forty mile gale with, not heaters, but cold snow for several miles to the windward. Such were the conditions our friend Spencer had to meet last year.

With such differences in conditions, it is enough to make the most optimistic hesitate before investing $20 to $50 an acre in an insurance policy which may not insure.

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These losses of crops, these freezes and comparisons with the west are not only known to most of you but are a subject upon which too much study has driven some of our best growers out of the state. There would be little use for me to bring them before you except that after you have heard the experience of other growers in a like region with your own you may reflect upon the enormity of the loss and decide to risk your money in an insurance policy. Too many of our fruit growers have left our state and have gone west. If orchard heaters will bring our middle western states back to a profitable production of fruit, how much better for our growers here close to market than to go west. This question then has a bearing in a small way upon the economical question now before the public, the loss in our population in the past ten years. Let us hope this qeustion may be put beyond the experimental stage the coming spring so that if it is possible to save a fruit crop under plains conditions we may feel sure of it.

I wish now to call your attention to specific instances in the Mississippi Valley where orchard heaters have been used whether successful or not, at the same time stating cost, time of heating, and temperatures so far as possible.

You are all more or less familiar with Mr. Mincer's success and I will stop only long enough ot call your attention to his article in the last Fruit Grower. He states that he fired 9 nights ranging from 5 to 20 hours per night. Mr. Mincer had 1,000 5-quart pots for 900 trees. He was able with this equipment to maintain a difference of from 5 to 10 degrees between outside and inside the heated area. Mr. Mincer does not state the cost of his entire outfit but he states that it cost him about 7 cents per bushel on his crop harvested.

L. A. Goodman of Kansas City, with whom you are all acquainted, writes under date of October 17, 1910: "We used 5,000 Hamilton heaters last spring. They hold 3 gallons each and cost 36 cents delivered at our orchards. Oil costs us 2 3-4 cents per gallon delivered. We used 35 to 40 pots per acre, averaging about one pot for two trees, and raised the temperature 3 or 4 degrees, but enough to save the crop. We used about 6 gallons of oil to each pot during the season of four nights. We had two storage tanks of 5,000 gallons each. Trees are about 12 years old and were loaded with fine fruit this fall. It is a great sucess."

A summary of Mr. Goodman's experience would show his cost per acre to be $14.40 for 40 pots, $6.60 for oil. Cost of refilling, lighting, etc. would not exceed $2 per acre. The two storage tanks may have cost $200; this divided between his 5,000 pots would amount to 4 cents per pot for storage or $1.60 per acre. This makes the total cost less than $25 per acre, or 33 1-3 cents per tree. The cost per bushel ought not to exceed 5 or 6 cents. The second year, without storage tank and pots to buy, the cost would be reduced to $9.40 per acre or 12 cents per tree, or 2 to 3 cents per bushel. Mr. Goodman had too few pots but the cost could be doubled and still be made a paying insurance.

Some parties doubt whether or not the pots in this orchard or in one or two other Missouri orchards really saved the fruit, thinking they made but little difference.

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W. A. Irvin of Springfield, Missouri, protected his orchard with heaters of his own invention. He describes them as follows: "The stove-pipe heater, one-half joint of stove-pipe, with concrete bottom, bailing wire handle, with holes punched one inch from top to aid combustion." He used fuel oil costing 3 cents per gallon in car lots. He used 2,000 gallon wood tank to store oil in. Had 1 car, 6,000 gallons of oil. Heaters cost 7 cents each, holding 1½ gallons of oil, and will burn for 7 hours. He invested $300 and sold $3,000 worth of fruit net. He says he tried to protect 6,000 trees with 3,000 pots but should have had a heater for each tree. Temperature outside the orchard 26 degrees and inside 32 degrees. Mr. Irvin ran out of oil at 7 a. m. and the temperature dropped to 28 degrees in the orchard, thus causing him to lose nearly half a crop. It pays to be well equipped and Mr. Irvin with a little more oil could have nearly doubled his crop this year.

Let us introduce some less optimistic letters. Mr. L. H. Haseltine of Springfield, Missouri, writes: "We used a pot of our own make something like the Troutman and a few Troutmans. They hold about two gallons. These cost about 18 cents each, oil cost 4 cents per gallon. Total cost about $35 per acre. We had from 2 to 4 degrees warmer inside than outside the orchard. Can do nothing on a windy night. It is very expensive and a hard job, when you have to fire all night. If you were firing only one night it would not be so bad. But we had to fight for ten days this last spring and were all worn out and about ready to quit." Mr. Haseltine does not state his success but I understand he saved a large percentage of his crop. It takes courage and perserverance to outdo Jack Frost.

Here is an old-time method and one of interest I think. Mr. Nort. Butterfield of Auburn, Nebraska, used fuels of different kinds but without pots. He describes his methods as follows: "I kept no record of expense of heating my orchard but will estimate as nearly as I can. I bought, for $5.00, of a neighbor a straw pile which was located just off my place at the northwest corner of the orchard. When it first turned cold I lighted that, which with a northwest wind carried heat and smoke thru my entire orchard of thirty acres and lasted 48 hours. The brush from pruning I piled in every vacant place and outside so that from whatever quarter the wind might change, heat would be available. On these brush piles I had straw and wet manure; on 75 brush piles there were thirty loads of manure and straw. I did not count the cost of hauling manure and piling brush as that was necessary anyway. The manure used was worth about $15.00 for fertilizer. I lighted fires for about ten days, a few at a time, some lasted for 24 hours. I cannot estimate the cost of firing as I did all the work myself. I lost lots of sleep and I was the laughing stock for the neighborhood. I was ridiculed by every passerby. Now the tables are turned. I have $1,000 worth of fruit. My peach and apple trees are bending down with fruit." Mr. Butterfield saved his crop for about 5 per cent of its value, not an expensive outlay.

The most discouraging record received came from the Missouri Fruit Experiment Station at Mountain Grove. "We used our spray tank very successfully for distributing the fuel oil to the smudge pots in the orchard. Our outfit is equipped with a rotary pump and we could put 5 barrels of

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oil into the tank in less than ten mintes. We could distribute 10 barrels in this manner in about one hour and a quarter to an hour and one-half. So far as our experiences go it is the most unique and convenient method of distributing the oil that we have known of. In our work here last season we used several makes of pots which were distributed as closely together as it was thought advisable to place these different makes, in order that we might get some line on the comparative value of each. As a rule we distributed 70 pots to the acre, but in one plot we had 160. While we fired three different nights there was really but one night that it was needed. That was April 23d and 24th. On these dates we had 33 hours of continuous freezing weather with a minimum temperature of 26 degrees. In the block where we were using 160 pots we were unable to keep the temperature above 29 degrees. There was a terrific wind blowing. On other occasions, however, when the air was still and the minimum temperature outside of the heated areas was 31 degreees or 32 degrees, we were able to maintain the temperature at 34 degrees or 36 degrees inside. I am unable to tell you the cost of heating per bushel as we had no bushels to reckon from. The only apples we have on the place this year were of the Ingram variety and they were as good outside the heated area as inside. We burned a car load of oil. I might add farther that in using our spray-rig to fill pots with we simply used two leads of hose with a cut-off and a short piece of pipe at the end and filled two rows at a time."

The use of the spray tank as an oil tank will help to solve that problem. The engine could be removed if the outfit were not equipped with the pump mentioned. 3 degrees is a small margin with 160 pots per acre.

Mr. Tullivan of Wichita, Kansas, used 70 pots per acre and while no data are given as to cost and efficiency, the temperature table is interesting.

Time	Outside Temperature	Inside Temperature	Difference
3:00 A. M.	30	32	2
3:30 A. M.	28	31	3
4:00 A. M.	27	34	7
4:30 A. M.	26	35	9
5:00 A. M.	26	36	10
5:30 A. M.	27	36	9
6:00 A. M.	28	38	10
6:30 A. M.	28	35	7
7:00 A. M.	30	38	8

The average difference over a period of 3½ hours was a little over 7 degrees, the maximum was 10 degrees, and the minimum 2 degrees, but at a time when danger of injury was slight.

Other men in Kansas who successfully fought frost were W. B. Eames, Delphos; J. L. Relham, Hutchinson; and James Sharp, Council Grove.

O. P. Kinsey of Valparaiso, Indiana, in the last Fruit Grower, reports the use of 600 coal pots in eastern Ohio. After firing ten nights he states that it was of undoubted success and expects to add more heaters next year.

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The Missouri Experiment Station at Columbia, Missouri, succeeded in raising the temperature 8 degrees in 1909 with 100 pots per acre and only 3½ degrees with 70 pots per acre. This is more evidence that sufficient pots be on hand for the worst conditions.

One of the most encouraging successes that has come to the writer's notice was that of Chas. Dickinson of Lincoln, Nebraska. Mr. E. F. Stephens of Crete, Nebraska, writes as follows in the National Horticulturist:

"Mr. Charles Dickinson of Lincoln, Nebraska, intended to use two thousand five-gallon rectangular pans, but he only succeeded in getting fourteen hundred, in which he used about forty-two hundred gallons of crude oil, costing twenty-nine dollars per thousand gallons. Cost of oil and tank, $121.80; cost of hauling the oil three miles to the orchard and placing it in pans, about $32.00; five men working three nights to light and extinguish the fires, counting wages at $2.50 per night, $37.50; making a total expense for oil and labor $191.30.

Cost per tree, fourteen and six-tenths cents. The trees average thirty feet apart, and there are forty-eight per acre, which gives a cost per acre of $6.52. The yield is now estimated at two hundred bushels per acre, or about the same as last season, which makes the cost of labor and oil 3¼ cents per bushel. The cost of the pans should be distributed over ten years, as they can be used fully that length of time. The original cost of the pans, with covers, was 32 cents, to which add interest and storage, 28 cents, making a total of 60 cents, or an annual cost of 6 cents. The cost per acre for use of pans is $2.88, to which add oil and labor, $6.52, making a total of $9.40. It will be seen from the above figures that the cost of protection per barrel of three bushels is thirteen and one-tenth cents.

Orchards of varieties best suited to Nebraska, and of greater age than Mr. Dickinson's, sometimes yield up to twenty bushels per tree instead of four and a fraction as on young orchards as noted above, lessening the cost of protection per barrel. In the season of 1909 Marshall Bros., of Arlington, Nebraska, gathered two thousand bushels of apples from one hundred trees. The writer, of Crete, Nebraska, has gathered twenty-five, thirty, and thirty-nine bushels from single trees in one crop."

In the last issue of the Fruit Grower is an interesting account of the Dolsen Brothers of Lanagan, Missouri. It will pay to read this article. At an expense of 12 cents per tree they saved a crop worth $200 net per acre. They had considerably different conditions from our Iowa growers, as they did not have the winds to contend with.

A record of temperatures, using coal pots, was kept by O. B. Whipple of the Colorado Experiment Station and while the outside temperatures are not low I believe they are nearly as low as we will ordinarily experience.

The conditions under which the test were held were such as one would experience in fighting frost in the spring. One hundred heaters were well spaced at 29.5 feet, covering two acres of ground. In placing the thermometers, I was careful to see that no pots were closer than 20.5 feet. Waste saturated with one-half crude oil and one-half kerosene with tree prunings were used to start the fires. The fires were started at 7:45, and responded

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promptly as the table will show. One man lighted the 100 pots in eight minutes. All pots started without trouble. The pots were refilled, beginning at 10:15, one man completing the job in forty minutes. A few of the pots on a part of the block were again refilled at 12:30, and all burned until the end of the test. In all two tons of coal were consumed in the seven hours, making a total of forty pounds per pot. The coal used was one-half lump and one-half nut and came from the Farmers' mine and Stokes' mine. The temperature readings shown in the table were taken at an elevation of seven feet from the ground. A thermometer at 12 feet from the ground inside the heated area showed one degree higher temperature.

The following is the table showing the temperature readings for the full seven hours:

Hour	Outside	Inside	Gain
7:45 P. M.	32.2 F.	30.2	...
8:15	31.1	35.6	4.5
8:30	28.4	32.9	4.5
9:00	28.4	34.2	5.8
9:30	28.4	33.8	5.4
10:00	28.4	34.2	5.8
10:30	27.5	32.9	5.4
11:00	27.5	33.8	6.3
11:30	28.4	36.0	7.6
12:00	29.3	36.9	7.6
12:30	25.7	32.6	6.9
1:00	26.1	32.4	6.3
1:30	26.6	33.8	7.2
2:00	28.4	35.6	7.2
2:30	28.4	34.5	6.1
3:00	28.4	33.4	5.0

O. B. WHIPPLE,

Field Horticulturist, Colorado Experiment Station,

One ton per acre burned for 7 hours.

COST OF COAL AND OIL COMPARED.

Each grower must decide for himself what heater he will use, the kind of fuel, kind of storage tank, etc. Heaters of all makes are advertised in our fruit journals and need not take our time here. Oil was secured last year from 2.9 cents to 4 cents per gallon in carload lots. Coal will cost from $3 to $5 in the orchard depending upon distance from market and kind of coal used. Prices at the mines near Saylor are $2.10 per ton but this coal is apt to have a large amount of dirt and a higher priced coal would be more satisfactory. The cost per acre will run from $15 to $40.

The following comparison of coal and oil as fuels was made by E. F. Stephens in the February 5, 1910, issue of the Rural New Yorker.

"As to amount of coal necessary to maintain a temperature of 32 degrees, orchardists give widely varying reports, gauged no doubt from the atmospheric conditions and the longer or shorter period needed to maintain the heat. J. J. Silva, foreman of the Paeonia orchards, reports that the first night he used 17 tons of coal for 1,525 pots burning three hours. The second night he used 43 tons of coal for the same number of pots

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burning seven hours. He used coal pots at the rate of 40 per acre. This would show that on a cold night with seven hours firing the amount of coal consumed would be about one ton per acre. Coal is very abundant on the western slope of Colorado, and is usually worth $1.50 to $2.50 per ton at the mines. In many districts it can be had within team-hauling distance.

"Oil Heaters. Oil in Colorado at the refinery is worth 3½ cents per gallon in tank cars. A tank car holds 6,000 gallons, and is regarded as a suitable quantity for an orchard of 10 acres. The oil has a fire test of 295 degrees, gravity of 31-31½. A storage tank suitable for 6,000 gallons of oil will cost about $240, a wagon tank for use in transporting the oil from the car to the storage cistern and again from the cistern to the pots would cost about $50. Whether the orchardist should use oil or coal depends largely on the cost of coal and the comparative cost of oil. The manufacturers of oil heaters claim that heating with oil is more convenient. Orchardists who have used coal express their preference for the use of coal, it costing less to prepare for the use of coal than for the use of oil. Other orchardists have secured beneficial results by saving the branches pruned from the trees, the utiliaztion of stable litter, damp straw and the preparation beforehand of a considerable number of brush piles, formed of slowly combustible material. In Idaho and in Washington, good results have been secured by the judicious use of this crude material. E. F. Stephens."

The following statement is given by the Hamilton Orchard Heater Company:

FIXED COST OF EQUIPPING TEN-ACRE UNIT.

"Probable expense for equipping a 10-acre average full bearing orchard, which may be regarded as the fixed investment, with each item figured at full retail prices, is as follows:

500 Hamilton heaters, at 45c each	$225.00
One 3,000 gallon cement cistern, at 75c per barrel	71.00
One 200-gallon iron tank for wagon tank	20.00
Four 1-gallon gasolene cans, at $1.50	6.00
Three good thermometers, at $1.00	3.00
Fixed investment	$325.00

Above is the total fixed investment for installing and equipping a 10-acre orchard for protection by the Hamilton orchard heaters. Where the orchard is totally or partially isolated, we recommend the additional installation of a row of heaters around the exposed sides. This is a varying item, but will not materially affect the first cost. To this must be added the cost of oil, which is also a varying cost. At the price paid for oil delivered in the Grand Valley last year, i. e., 5½c per gallon, the grower can fix the cost for his individual case. We would recommend the initial purchase of at least 1,500 or 2,000 gallons, to be stored in the cistern prior to the possible need of the first firing. Where the grower is conveniently located close to a source of oil supply that can be obtained in any desired quantity at any time during the 'frost period,' this amount

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of oil is probably all that it would warrant purchasing. Where the possible year's supply must be ordered ahead, we would recommend for ample protection, the purchase and storage of 3,000 gallons of oil."

The following notes on cost of heating are given by Professor W. L. Howard, Missouri Experiment Station, Columbia, Missouri:

"The wholesale prices of heaters range all the way from $120 to $750 per thousand. Some of the oil heaters are made of a very inferior grade of stove-pipe iron, which, even under good care, are liable to wear out in two seasons.

"These heaters should be used at the rate of eighty to one hundred per acre.

"Oil heaters made of heavy iron, if properly covered with a coating of crude oil before being stored away for the winter, should last four or five years and possibly a great deal longer. Where made of heavy material, like the Hamilton, I can see no reason why the heaters should not last ten years.

"Counting one hundred heaters per acre, the cost of heating per acre would be approximately as follows:

"First year:

Heaters	$20.00 to $45.00
Oil or coal	5.00 to 10.00
Labor	2.00 to 4.00
Total	$27.00 to $59.00

"Second and third years:

Total	$ 5.00 to $14.00

"At such a low cost as this there is no reason why so much fruit should be lost each spring from frost."

INJURIOUS TEMPERATURES.

Much discussion has arisen as to temperatures injurious to fruit when in bud. Definite knowledge of this subject is of much importance, as failure to light the pots at the proper time may cause much loss after all the expensive materials have been prepared, while lighting too early will use up valuable fuel which is not only a useless waste but this fuel may be needed at a critical time. The following injurious temperatures for the apple are given by the United States Department of Agriculture. When in bud 27 degrees, in blossom 29 degrees, in setting fruit 30 degrees, and at other times 25 degrees.

Much time, worry and sleep may be conserved if the orchardist expecting to heat will get in communication with the nearest weather bureau office. With modern telephone and telegraph facilities this can be done at a moderate cost. The bureau is always more than willing to co-operate with any growers who will apply. Mr. Spencer kept in communication with the Omaha office last spring and they were anxious to give all the aid they could. The grower may become his own forecaster at a moderate cost and this will be a valuable addition to the weather bureau service and in its absence will be a very necessary addition to equipment. This

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TYPES OF ORCHARD HEATERS

Three at left of top row are coal heaters, the others burn oil.

—Photograph from Lorenz Greene.

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topic is well discussed in Farmers' Bulletin 401 and it will be well to secure and study this when equipping the orchard. Other sources of information along this line may be found in our horticultural press and in Circular of Information No. 35, published by the University of Missouri, Columbia.

In the above report an attempt has been made to review as many of the experiences with orchard heaters in the Mississippi Valley as was feasible in a short paper. An equal amount of attention has been given to the failures and to the successes. An attempt has been made to show something of the enormous loss due to frost, thus making some means of protection imperative if fruit growing is to be continued, and also to show that while orchard heating is in an experimental stage here there is hope that it may save the day. Without exception the man who tried orchard heating last spring will try it harder next year. Where they were well prepared they call it a decided success though a costly one. There is probably not a man who tried smudging last year who is given full credit by his neighbors. Many go so far as to say that not a single instance has been recorded where a man claims to have saved his crop who did not live in a neighborhood which produced some fruit. Whether this may or may not be true, the fact that the man who tried it is willing to put more money into a better equipment is good proof that he at least believes in it. When the kind of weather that the smudger was forced to contend with last season is considered in comparison with what he will usually meet, encouragement ought to follow. The usual amount of heat necessary to protect the fruit will not exceed 5 or 6 degrees though the season with ten degrees of freezing will occasionally return. Whether the Iowa orchadist will be able to save his crop under all conditions with present facilities is a doubtful question. That he may save nine out of every ten crops and increase the production of a larger percentage than that is at least feasible. Let us hope that at our next session we may be able to say that this question is settled once for all.

MR. SPENCER: What kind of heater did Mr. Dickinson use?

PROF. GREENE: It was one of his own make. Whether he is going to put it on the market, I don't know; he made it himself and holds five gallons of oil.

MR. BLACK: I want to ask a question. I didn't notice in those papers that they referred to something I thought I noticed in my orchard last spring, that some varieties were hardier, the frost didn't affect some varieties as much as others; is that a fact?

MR. SPENCER: Isn't it just possible that it was due to the stage of advancement of the blossom? I think there is a difference in the hardihood of the trees. My observation in my orchard is, the Grimes Golden blossom is almost identical with the Winesap and Ben Davis.

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MR. VAN HOUTEN: I understood the Professor to say there was no place in the United States exempt from frost?

PROF. GREENE: That was my statement.

MR. VAN HOUTEN: The San Juan Islands are absolutely free from frost.

PROF. GREENE: I have no information on that subject.

MR. MOFFETT: I would like to ask a question with reference to the kind of friut. The Jannette apples do not come into bloom at the time the others do. Two years ago I had $100.00 worth right around my house when I didn't have anything else. If that be true, it seems to me the height of the acme of fine fruit might be associated with the Jannette.

C. O. GARRETT: I want to go on record as saying that it would have been practically impossible to have used the orchard heaters with any success in this locality, owing to the high winds we had last spring.

PROF. GREENE: I would like to add that it is rare that we have a wind like that.

MR. WRAGG: I am like Mr. Garrett about that. There are some things they have got to explain to me. They speak about Mr. Mincer's orchard. I happened to be in Southwestern Iowa and talked with a gentleman about it, who said that he happened to have an orchard two miles from Mr. Mincer's, and he didn't spray, and had just as good apples as Mincer's.

Down in the Ozarks, we have been thinking about putting them in for two years. We had a man figuring on coal, and he estimated it took 700 tons of coal. We have 168 acres on the north slope of the Ozarks. Our foreman said, the wind blew for two days at the rate of 50 miles an hour. Now, suppose we had hauled out 600 tons of coal and distributed it in that orchard, and then not needed it; what a great expense it would have been to gather the coal up again and take in the heaters. If you can figure out to me how you can control frost, I would like to know that. I do not believe you could control the frost a degree by the way the wind blew last spring.

MR. SPENCER: I am glad Mr. Wragg brought that question up just as he did. Mincer is on the south line of the state, just about a mile and a half from the line. I live about twenty miles north of him. It was reported that Mr. Mincer saved his crop. I didn't dispute it, and I went down there. A friend of mine said Mr. Mincer thought he saved it with the heaters but that he had

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as good a crop. In September I went down there again. We went three miles directly west from the Mincer orchard and there is another orchard, and this orchard had substantially the same varieties of trees. This orchard has been known as the Hawley orchard, unpruned and unsprayed, a neglected farmer's orchard, absolutely no protection, but a wire fence, and that isn't very good protection from the wind on the north. Mr. Mincer didn't claim but a good big half crop. This orchard had a full crop of apples.

MR. SIMMONS: I call your attention to Mr. Bechtel's crop.

MR. SPENCER: Mr. Bechtel had one or two Ben Davis trees that had conservatively speaking four or five bushels of apples on them. I had 1800 trees and about 12 bushels of apples. He is right on the edge of the killing frost. I do not pretend to say why that condition prevailed; it is a fact that it is born out in Nebraska. I was talking to Mr. G. S. Christy in Nebraska. He volunteered this statement: He says, we have a very peculiar condition here this year. I have a full crop of apples in my orchard and two miles north of me there are none.

PROF. BEACH: It would be interesting to have some exact information by reading the thermometer inside and outside of the orchard on the point of whether or not in the season of 1910, in the spring, it would be possible to save the blossoms from destruction by frost. Granting that it would be impossible in a season like 1910 to save the crop, still we are interested in this question of orchard heating. The season of 1910 was exceptional. We have plenty of evidence in other fruit districts that the crops have been saved repeatedly by the use of orchard heaters, and under conditions where they didn't use them they lost their crops. I am sure we are interested in the subject and would be glad to see experiments on a firmer bases. Let us understand as closely as possible what we can expect under ordinary conditions. I hope we have been able to save them from the frost under the conditions shown on the chart, where it appears that for a period of five years we have lost a great deal of money.

MR. REEVES: I visited Mr. Mincer's orchard in August and looked it over carefully. I went there for the purpose of seeing whether he really had saved his crop by using orchard heaters. His orchard is on the west side of a Missouri Bluff, fully exposed to the northwest wind. Mr. Mincer went with me through the orchard. He said the wind was blowing a gale, and he showed me where he placed the heaters. His trees are large trees with the

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tops interlocked. There were no apples on the upper limbs. Mr. Mincer stated the snow was falling and formed a sort of a blanket and kept the heat in, and he stated he raised the temperature ten or more degrees; that the grass outside of the orchard would break under his feet, and inside it didn't freeze. He was fully convinced that he saved his apples. I looked over carefully the surrouding conditions there. Just across the road where he didn't use the heater there was absolutely no fruit. When I left there I was fully convinced that he saved his fruit, but since talking with Mr. Spencer, I made up my mind I didn't know anything about it. It was not a full crop. I estimated the different trees, and in talking the matter over with him, he admitted he had about a quarter of a crop. Now, whether that was absolutely saved by the heat, I dont know. Other conditions may have come into play there. There is something peculiar about it. If he raised the temperature 10 degrees in an orchard of that sort, how much can we raise it in an open orchard. I have not lost faith in the orchard heaters, even if Mr. Mincer did not save his fruit by their use.

MR. TANNER: How many nights did he keep the fire up?

MR. REEVES: Nine nights, was his statement.

MR. BUSSEY: A year ago when it froze up with us, there was very little frost in the ground, probably two or three inches. A year ago to-day we had a fall of 14 inches of snow, that prevented any hard freezing of the soil. During the winter we had probably four feet of snow; something unusual for us. When the snow left us in the spring, there was no frost, and in two or three days the leaves on our trees were out, and the conditions were so unusual that it would be almost impossible to duplicate them again for a life time. I don't know whether the coal or oil burners would save the fruit or not. We had some fruit up in the district up near Green Bay. They are making a business of it up there and claim it is going to be the garden spot of Wisconsin as far as fruit growing is concerned. Although they had frost and snow, the temperature by reason of the water on both sides was changed.

MR. SPENCER: I would like to ask Mr. Greene to tell you what observations we had as to the amount of heat we could make in my orchard. I would also like to have him explain the peculiar condition of the weather during the night.

PROF. GREENE: I was at Mr. Spencer's on the night he heated his orchard, on April 16. I got there about 11 o'clock and immediately placed the thermometers. I cannot recall the tem-

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perature definitely, but the temperature outside of the heated area had dropped to about 27, while inside the heated area it was about one degree higher. I believe it was about 12 to 1:30 when the temperature outside of the heated area began to rise and went to about 30. About 2 o'clock Mr. Spencer thought it was all over with and went to sleep, but Mr. Rich of Council Bluffs and myself stayed there talking, and I went to look at the thermometers, and they had dropped again, dropped even as low as before. The temperature inside of the heated area varied. I found the difference to be from a degree to a degree and a half, with 40 pots to the acre. In Missouri, with 70 pots they raised the temperature three degrees; with 100 pots they raised it 7 degrees. I would like to ask Mr. Spencer to compare the tops of the trees of Mr. Mincer's orchard with the one we saw in Missouri.

MR. SPENCER: I think Mr. Reeves' estimate was not quite correct. He thought he had a good big half crop, which I concede. This other orchard, if there hadn't been a killing frost, we would not have looked at it the second time. They were ornery looking apples. Mr. Bechtel and I decided we would call this a full crop of apples. Some of those apples are out here on the table.

MR. PATTEN: It seems to me that it is impossible we have overlooked an important point in this discussion. That is, that the frost areas are sometimes very narrow in their effects, and it is more than likely that Mr. Bechtel's orchard and the other one mentioned were out of that frost belt. I would say, from the discussion that has gone on here, that Mr. Mincer's orchard did not have a worse condition, that is, a colder temperature than the other orchards. Mr. Greene speaks of the temperature rising and falling, which shows that the temperature fell and rose, and that there was quite a varying degree of temperature. You gentlemen, have often noticed in passing through the country that a corn field has been seriously cut by the frost, and another one just a little ways off has escaped frost almost entirely. I have seen on the open prairies, where there was a slight depression of the land, the frost was severe, while on a slight raise, a few rods away a piece escaped injury. I think this may explain a great deal what we are talking about.

THE PRESIDENT: I would like to ask what is the comparative cost of coal and oil; what is the comparative cost of the two heaters, one burning coal and the other oil?

PROF. GREENE: I cannot give you a definite answer. That would depend very much upon the cost of the two products. I

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suppose the coal in Iowa could be obtained for about $2.75, which would however contain large amounts of dirt. Oil can be purchased at 2½ to 5 cents per gallon in carload lots. In barrels, I think it was stated last year, they purchased it at 6 cents a gallon. The comparative cost would have to be figured after you have all the conditions known, distance from the market, etc. The pots will cost all the way from 12 to 45, even 75 cents each; the coal pots from 25 to 40 cents each. It is a hard matter to estimate just what the cost will be until you have decided on what kind of a heater you will buy, the distance from the market, etc.

MR. WRAGG: Will a dollar's worth of oil produce as much heat as a dollar's worth of coal?

PROF. GREENE: That depends on the cost of it.

MR. SPENCER: Of course, we all base our ideas upon our own conditions. If you will place a coal pot there, you will have to have a little kindling. When you put the oil there, your lighting is purely mechanical, and it burns just so much. I don't think coal is practical in Iowa. It is really not a question worth discussing because fuel is the small part of the cost of heating an orchard. There are several methods. The method I use is practical and works to a charm. You take excelsior and drop it into the pot, and it is as inflamible almost as a ball of cotton. Without that a man can take a tablespoon full of gasoline and throw it in there and light the torch.

THE PRESIDENT: About 12 or 15 years ago, a gentleman who lives near the end of the county, wrote down to me for some information along horticultural lines. In that letter he went on to say he did not like the idea of using poison so much. He said he had an arrangement to burn coal; he put it on the wheelbarrow and wheeled it around under the trees, and that it served as an insecticide and fungicide. Now, it might be that point should be taken into consideration when we are heating up an orchard.

MR. SPENCER: There is a claim that in all orchard heating the carbon is beneficial.

A MEMBER: This is one of the most important subjects before the Horticultural Society, one that should greatly interest every fruit grower in Iowa. The effects of the frost has driven many out of the business and others are thinking of following. The smudge pot has been spoken of, and the straw and wood. But they are hardly practical; we have tried them. They may do very well often for a night to ward off a little frost, but for lack of material, we usually catch it the night following. If we can by means of the

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smudge pot control the frost we would accomplish one of the greatest benefits to fruit growing in Iowa. We are right at the market and can grow better fruit than they can any place in the country.

I would like to ask the gentleman how many men it would require to light 1000 smudges.

PROF. GREENE: The best figures I have seen are that, one man will light 300 in an hour.

MR. BOMBERGER: There is always a good deal of theory about anything not yet made entirely practical. At the Horticultural Congress at Council Bluffs, this matter was just as interesting and absorbing a topic as it is here this afternoon. They were trying to get at a theory of saving their crops in the mountains, especially among the Grand Valley growers and further west.

I was told by some that they got good effects from the smudge and fires; that it was not the heat so much that the burning of the fuel would make, as it was to hold the heat in the orchard, that was given out by the earth that had been absorbed by the dropping temperature—the canopy that they can make over the orchard would really save the crop. In the changeable western weather they would have a temperature of from 60 to 75 degrees for a week, and during that period the earth will be taking in the heat, and then if there is a drop down to 36 or 30, there is a large amount of heat in the soil, and this canopy of smoke over the orchard retains that heat. We had an illustration of this this summer in western Iowa, at least, as to what amount of heat the earth will take during a very protracted hot period. During the months of July and August the temperature in the sun was from 80 to 120, and the earth had absorbed the heat so that it was in a regular hot bed condition. On the 13th day of August we had a heavy rain, nearly 2½ inches. At the end of five days we had 6 inches and a half. The fifth day we had grass on our bare pastures from three to four inches high.

MR. TRUE: If the wind blew 40 miles an hour you couldn't have a canopy.

MR. SPENCER: Of course, this spring weather conditions prevailed different from anything we ever had. Invariably when we had it cold enough to injure fruit in blossoming, it has been still. Under ordinary conditions I do not believe there is any trouble heating an orchard to 5 or 6 degrees.

MR. BLACK: It looks to me impracticable to use wood and brush. A number of years ago I was growing a good many strawberries,

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and I hauled a lot of stumps along there and fixed up for it and a rainy spell came along before the frost, and the stumps wouldn't burn.

MR. SIMONS: Three years ago I was in Colorado and they had started out to try out the smudge pots. I heard of Hamilton saving his orchard. I was in Denver at that time. I went up through Grand Junction to see what he had done. I believe there was about as good a test on the smudge pots as I have heard of yet. He had 20 acres of orchard there; he had a road running through the center; he didn't have enough smudge pots for his whole orchard, so he took the south 10 acres. When I was in his orchard there, the south 10 acres of trees were hanging full of apples, and when you went right over on the north half, you could find a few snarley apples there. Take it all around Grand Junction, it was practically a complete failure, until after you got down to Palisade, where there was pretty good fruit.

MR. HAMILTON: I have been practicing smudging. I have started little fires with light straw and threw damp manure over it, and completely covered the whole orchard with that damp manure. I had a small orchard in the corner right off of the one I treated this way, and you could distinctly see the line through the orchard, where that canopy of smoke would come over and would cover the whole orchard, except this little corner that I couldn't get into. I havent had any trouble covering a whole orchard with dense smoke and retaining it there until after sun-up, so that when the sun came up you would think it was cloudy all over.

PROF. GREENE: I think we ought to put more emphasis on the result of this chart. If you will note the crop for the year 1904, and then if you could have had an increase in the last five years of 20 per cent, you could have more than paid for your orchard heaters. It seems to me this is an experiment well worth trying. I think we ought to test them out thoroughly. There will be many who will test them next year. Mr. Hamilton of the Hamilton Heater Company, says he is going to put carload lots into Iowa. It seems to me when we realize what our loss has been, we ought to be willing to try some experiments.

QUESTION BOX.

QUESTION: What spray shall we use for the Oyster Shell Scale and the best time to apply it.

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PROF. GREENE: Lime and Sulphur. A solution of soap and linseed oil has been applied which controlled the Oyster Shell Scale very well. Mr. McCall who is here from the college, I believe could tell you more about this preparation of linseed oil and soap.

MR. MCCALL: Mr. Webster used it as a summer spray. We found no scale insects were crawling just after the blossoms opened out. It is very adhesive and sticks to the foliage. The Montana station reports this experiment quite successful. The formula is linseed oil and soap. It is quite an expensive mixture. On the whole it would be a very expensive spray, but if it was efficient that wouldn't enter into the cost. It was efficient in his experiment. I compared it with the trees that were not sprayed. We found very few of the scales had settled down where he had applied this mixture, and in cases not sprayed it was very bad. There is one thing about the Oyster Shell Scale, even though you do not spray at all they sometimes disappear.

MR. REEVES: Will it do any good to spray for the Oyster Shell Scale this time of year?

MR. MCCALL: They say it is all right to spray now. Of course the only injury it could do now would be to kill the eggs and they wouldn't hatch in the spring. In the spring it would be a little better, when the young scales might be crawling.

MR. HARRINGTON: Do you know whether any experiments have been conducted with the bordeaux mixture for the control of that scale?

MR. MCCALL: I haven't heard of any.

MR. HARRINGTON: Some years ago I had quite a little sprinkling of the Oyster Shell Scale in my orchard. I noticed, after a year or two they disappeared entirely. I have not within the last three or four years seen a single scale. I was inclined to attribute it to the use of bordeaux. Sometime in May the scale hatches out and for a short period the insect travels about, and I believe at that period the bordeaux was sufficient to destroy it.

THE SECRETARY: I never had any difficulty in controlling the Oyster Bark Scale with caustic solutions or soap, if applied occasionally after or at the time of hatching. I have very little faith in any preparation at any other time. I think Whale Oil soap will be just as effective as a kerosene emulsion.

QUESTION: Is the state law requiring nursery inspection meeting the end for which it was enacted; has such a law given general satisfaction?

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MR. REEVES: As far as my knowledge goes, the nurseries asked for that law and it is about what they wanted. They have complied with the law. I believe the nurseries are kept entirely free from insect pests such as the law aims to get rid of. The point the law does not cover is the shipping into the state of plants by individuals, which do not go through the nurseries and they are not inspected outside of the state. I do not believe the nurserymen are opposed to the law.

QUESTION: Can we kill the insect enemies by the application of arsenites if they do not eat the foliage?

THE SECRETARY: You cannot kill an insect which does not eat the foliage or fruit, except dust may enter the breathing holes.

QUESTION: Can commercial orcharding be made profitable in Iowa if Western methods are employed?

MR. REEVES: I will say, to some extent western methods should be applied, but not fully, because conditions are different. In many places in the west the climate is mild; you don't need the winter protection you need here; here you need winter protection.

MR. VAN HOUTEN: I have been studying western horticultural conditions for 20 years or more and for the last two years I have had contact with it from tropical Mexico to the British border. When you talk about western methods applied to Iowa, you are mistaken. For example, there is a county in the United States composed entirely of islands, and such a thing as a killing frost was never known. There are great areas in the west where winter killing is absolutely unknown.

QUESTION: What has been your success in top-working cherries?

PROF. ERWIN: I do not think it has been successful on the larger trees.

THE SECRETARY: Some 30 years ago I topworked some cherries, about a half dozen trees. The limbs cut off were about two and a half to three inches in diameter. The experiment was successful as far as growing and bearing was concerned; we had about five crops. The last crop set so heavy that the grafts were not strong enough to support the load and broke off. So that I would say, for topworking cherries it is not practical to work on as large limbs as those.

MR. VAN HOUTEN: The older members of this society will probably remember that I reported success with the late Richmond cherry in Southwest Iowa. I am satisfied now that our success was due in a large part owing to them being topworked on the

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common Morello sprouts. In that instance the late Richmond grafted on the common sprouts from the orchards were a success.

MR. PATTEN: Were they not more properly stockworked than top-worked?

MR. VAN HOUTEN: They were probably three feet and a half high; it is really stock-worked.

MR. PATTEN: In the early history of horticulture in this state, Henry Avery, of Burlington, worked a great many of the Early Richmond on the Black Morello stock, and my recollection of it is they were more successful than any Early Richmond I ever saw.

MR. BLODGETT: I was personally acquainted with Mr. Avery and know Mr. Patten's remarks to be correct.

MR. TANNER: Along about 1867 and 1868 I did work of that kind, cut off trees and top-worked them. They bore well for a few years. I don't think any of them lasted over ten years before they died out.

THE SECRETARY: There were quite a number of other trees that were stock-worked. I think all of the trees in the first orchard we planted in Iowa in 1856 were worked on stock two feet from the ground.

WEDNESDAY FORENOON SESSION.

(Joint Session with the Park and Forestry Association.)

THE PRESIDENT: Before opening the morning session of the program I will announce the judges on awards, which are as follows:

For the Northern District, J. W. Murphy.

For the Central District, E. E. Little.

For the Southern District, F. O. Harrington.

With this announcement I surrender the chair to Prof. B. Shimek, President of the Park and Forestry Association.

PRESIDENT SHIMEK: It seems that on account of the necessity of Mr. George A. Wilson withdrawing from the meeting early this morning, there must be a slight change made in the program. I postpone the remarks I have to make, and we will take up the next number on the program, "Powers of Park Boards," by George A. Wilson of Des Moines.

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POWERS OF PARK BOARDS.

GEO. A. WILSON, DES MOINES.

Before entering upon the discussion of the powers of Park Boards, I crave your indulgence for a few moments that I may make some statements concerning how the members of that commission, known as Park Boards, are selected or elected. We find that, by legislative enactment, there has been provided that there shall be elected at the regular municipal election in each city, containing a population of 40,000 or more, and all cities and towns may, by ordinance, provide for the election of three Park Commissioners, whose term of office shall be for six years, one to be elected at each regular municipal election. This provision of the law is a very commendable one, in that it makes the Board of Park Commissioners a permanent body and any reforms which are started by one Board are sure to be completed.

Now that we have seen how the Board is created, let us ascertain what their powers and duties are. On or before the first of August of each year, the Board makes, determines, and fixes the amount of rate, not exceeding two mills on the dollar, in all cities and towns, on the valuation of the real estate in such cities or towns, to be levied, collected and appropriated for the ensuing year, for Park purposes. This tax may first be certified to the city or town council, which shall thereupon levy such taxes as it may deem necessary to promote Park interests, and shall thereupon certify the per cent thereof to the County Auditor, as is done with other taxes for municipal purposes. Upon the collection of this fund, it may be used in purchasing or acquiring real estate for Park purposes, including streets and highways, or for other purposes necessary to the establishment or up-keep of Park paving, improvements, or repairing of streets adjacent thereto, for the payment of Park policemen, light or water. From this tax heretofore mentioned, must come the salaries of members of the Park Board, which is fixed by the city or town council, and cannot exceed, in the aggregate, annually, ten dollars for each 1,000 population, thereof, as is shown by the last state or federal census. The Park Board may acquire real estate, either within or without the city, for Park purposes, by donation, purchase, or condemnation, and must take title to it in the name of the Board in trust for the people, and such property, so acquired, is exempt from taxation.

It has exclusive control of all Parks or other grounds and may make such rules and regulations governing the conduct of visitors thereto as it may deem advisable. It cannot incur indebtedness in excess of the amount of taxes already levided or available. For the purchase of real estate for Park purposes, it may issue bonds for such sums as may be necessary, and the aggregate interest of all bonds so issued, by it or at any time outstanding, must not exceed one-fifth of the total taxes said Board is by law, permitted to levy. The bonds heretofore mentioned, when issued, are a lien upon all the real estate purchased by the proceeds of said bonds.

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We have seen how the Board is created, and how it may acquire property for Park purposes. Now, if you please, let us see what control they may exercise over the property so acquired. It cannot be doubted but that their jurisdiction extends over all lands used for Park purposes whether they be within or without the corporation limit. Do not understand from this, that their control is such that the city or its ordinances are of no effect, for this is not true. They may adopt such plans as they may deem advisable, for beautifying said Parks, planting of trees, or otherwise improving the same.

The Board may make rules and regulations for the government of said Parks and said rules become effective when entered in the record of the proceedings of said Board, and a copy thereof signed by the commissioners, has been posted at the public entrances of said Park. The violation of said rules and regulations, is by statute made a misdemeanor by express statutory provision, the Board has power to regulate or forbid all poles or the stretching of wires for electric light, street, railway, or other corporations or persons in such Parks or in or along the highways adjacent thereto, or over other public places controlled by them.

So far my remarks have been devoted to the powers of Park Boards in cities where such Boards exist. Now let us see what provision has been made for the control of Parks where the city or town has not deemed it of sufficient importance to create a Board of Park Commissioners. We find that where no Park Board has been created, the Mayor, one member of the City Council, appointed by the Council, and one resident property owner of the city or town, appointed by the Council, shall have control of said Parks and public grounds, whose powers and duties are as defined above, save that of the levy for Park purposes, which is determined by the population of such city or town. There also obtains in certain cities, that form of government known as the Commission or Des Moines Plan of City Government, and doubtles it will be well to make an investigation and determine the situation as to Parks in cities where such government obtains.

Upon the adoption of this plan of government, the Board of Park Commissioners is done away with, and their powers and duties are vested in the City Council, which may exercise all the powers delegated to said Board of Park Commissioners. There is created a department known as that of Parks and Public Property, and the Council determines the duties to be performed by the head of said department. So the duties and methods pursued depends entirely upon the direction of the City Council. It is very gratifying, indeed, that, so far as we are able to ascertain, those to whom the duties of looking after these Parks has been entrusted, have recognized the importance of their work and have performed commendable services, and while public needs and sentiment is now greatly stimulated by the work already done, our undivided efforts should be put forth in an effort to increase our Parks and to educate the old, as well as the young, to properly protect and care for them. Let us teach them to say and respect the words of the poet:

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"Woodman, spare that tree!
Touch not a single bough!
In youth it sheltered me,
And I'll protect it now."

To you, gentlemen, belongs untold credit for the increased sentiment in favor of the same. Your work, however, is just begun. With our great and rapid increase of population, the importance becomes apparent. Put forth your best efforts and so far as possible, see to it that every school shall teach the rising generation the value of the Parks, and how to plant and care for trees, and you will then have performed for humanity a service so great that your names will be ever near and dear to those who follow.

It appeals to me that this discussion would lack in the essentials of completeness were nothing said in regard to the control of that portion of the street between that used for traffic and that used for sidewalk purposes. There is nothing more pleasing to the eye than to gaze along a street beautified by stately trees. But one is at once confronted by the thought of who is responsible for their existence, and to whom they belong. But a moment of serious thought is required to arrive at an answer as to whom they owe their existence. For here we see the lordly oak, or the stately elm; there, the squatty box-elder representing perhaps, the peculiar tastes of different individuals, and from closer investigation we find they have been planted by the abutting property owners. Their public spiritedness we must admire, but their tastes need education.

While the abutting owner on the street has a peculiar interest in the same, it cannot be disputed but that, in this state, the title to the street is in the city, and the city, as such, under the law as it now obtains, may control the removal and direct the planting of such trees as it may desire. It is equally as true that a Board or Commission created by legislative enactment, has only such powers as it is expressly or by implication, given by statute, but a glance at the statute creating the Board of Park Commissioners will show us that they have no authority over the streets.

All will undoubtedly admit that the attractiveness of any city depends upon the trees along the streets. Trees make the poor man's cottage a palace, and his street rivals that of the rich. But aside from the fact that trees are beautiful adornments, they have medical properties. They certainly add to the healthfulness of the city by cooling and purifying the air. Scientists tell us that the air we breathe is formed of oxygen, carbonic acid gas, and ozone; that oxygen is generated by the plant life; that carbonic acid gas, so poisonous to animals, is absorbed by the plant life, and is one of their necessary elements. That it is more healthy in wooded districts than in treeless streets cannot be doubted. Trees then are one of nature's own purifiers, and the planting of them a sanitary measure. Investigation has proven that the presence of trees decrease bacteria and dust particles, and thus decreases air impurities. It is not necessary to make any remarks upon their value in increasing the value of realty. You gentlemen know of their value and know any property, barren of trees, is not a desirable property.

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You ask what can be done. And in reply I desire to state that I find from investigation, that in several of the states of the union, the legislature has passed an enactment which provides for the appointment of a Commission of three free holders, who shall have an exclusive and absolute control and power to plant, set out, maintain, and care for any of the shade trees in any of the public highways of their respective municipalities. The cost incident to the planting is borne by the real estate in front of which the trees are planted or set out. This cost is certified and collected as other taxes, and becomes a lien upon the property. The cost and expense of caring for the trees after being planted or set out, is borne by a general tax on the real estate within the municipality. This commission is given power to make such rules as they may deem best for the protection and preservation of the same, and relative to the kind and manner of planting of trees. I am advised that this plan works well and is very satisfactory. No doubt property owners may object to the planting of the trees and the payment of the costs therefor; but it is entirely due to their shortsightedness, for every tree planted increases the value of the abutting property, and the cost of planting is only nominal.

We are in a good position in this state to take up the improvement of this kind, as every city or town has its Park Board, and all that needs be done is to have the legislature of our state, when it meets next January, pass an act placing the control of that portion of the streets in the hands of the Park Board and allow the Board to make a levy for the upkeep and for the protection of the trees therein. If this be done, our streets will soon become beautiful, our cities one grand park, where one may always breathe the pure air nature intended us to have, and it will be a standing invitation for out-of-doors life by day and night, and the clammy hand of the great white plague will be shaken from the throats of a no small number of our friends and neighbors.

Undoubtedly you know that it is necessary, to secure results, to have control lodged in some specific body, with sufficient powers to act and protect. You know too well the boy on the street, the runaway team and many other elements tend towards destroying in a few minutes what has taken years to accomplish. There is not a tree, I venture to say, in the streets of this city today that does not need attention. Is it right that we should neglect such an important duty? A duty that yields pure pleasure and joy to a people, increases their satisfaction, and by so doing makes better citizens. Gentlemen, the question of planting trees is important. Their protection and development is a real usefulness.

We hear much earnest discussion nowadays, about why the population of Iowa is decreasing, and, sirs, it is an important question, and should receive serious thought. It cannot be doubted but that there is dissatisfaction somewhere. It cannot be on account of the fertility of the soil. It certainly is not on account of the lack of law abiding citizens.

That learned student and scholar, Dr. Elliott tells us that, "the final aim of government by the people and for the people, is to increase the satisfaction and the joys of life to the hightest possible degree, for the greatest number of persons—to increase, that is, the number, variety and intensity of those sensations and emotions which give innocent and fre-

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quently recurring pleasure." That is precisely the kind of pleasure given by plant life, and especially trees. To pass one noble tree, whether it be the graceful outlines of the leafless trunk or limbs, the tiny bud, the rustling canopy of green, or the splendor of autumnal colors, increases the satisfaction, and leaves firmly reposed in one's heart that feeling of contentment so greatly desired by all.

The importance of your work is everywhere apparent, and the good you are doing is so great, that human minds cannot yet appreciate it.

THE PRESIDENT: The discussion of this topic will be opened by G. B. Healy of Sioux City.

MR. HEALY: Gentlemen—I do not know that I can add very much to what has been expressed in the paper. I can say, Amen, to everything that has been said; it seems to me, the ground has been pretty fully covered. We are living in a time when people are thinking and discussing the desirability of living more in God's great out-of-doors. Yet we have a strange paradox. At this very same time people are leaving the farms and deserting farm life and are thronging the city centers. Why this should be, I do not know. Probably it may arise from a desire for more social intercourse. Man is a social animal and likes to mingle with his fellows. But, however the fact may be, as to the cause, it exists, and people are crowding more and more into cities, and we might paraphrase the oft-quoted remark of Mohamet: "If the mountain will not come to us, we must go to the mountain;" if the people will not go to the country, we must bring the country into the city. Wide-awake cities and towns are providing country opportunities in the city. The larger cities, like Chicago, New York, Boston and Washington, are advancing very rapidly along these lines, as we all know; and parks and boulevards, etc., have been developed in Denver, Kansas City, Minneapolis, and they are expending millions for the development of their parks, boulevards and playgrounds. These last named cities are spending somewhere in the neighborhood of about $200,000.00 a year each. In this very city, Des Moines, the park development is receiving considerable attention, and it is spending from $60,000.00 to $80,000.00 a year. Last summer I had the pleasure of going through the parks of Des Moines, in company with the Superintedent, and with the aid of an automobile we covered the ground fairly well. I was surprised to note what has been done in Des Moines along this line. I had no conception of the natural beauty of your park lands, and the splendid manner in which they are being handled under this

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new regime. Des Moines is evidently leading the state in this regard, as also in some other respects. But, while driving from park to park, through the streets, I noticed that you have the same condition in Des Moines that we have in Sioux City and elsewhere. We have to go through unsightly streets. I do not know why they exist, unless it is to present a horrible example of contrast, and in that way perhaps spur us on for changes towards betterment.

We all know how it is. The individual property owners will plant trees of all sorts and kinds, and perhaps out of one hundred trees from the nursery, ten may reach a full maturity; many of them in a disfigured condition. Trees are bought and in order that they may be set out easily and cheaply, any man around the premists digs a hole, sticks in the tree and throws the dirt around it; and the majority of the trees so planted will die. I suppose there is not, perhaps in the city of Des Moines, and in any of our cities, one man out of five hundred who knows how to cut a limb off a tree. There isn't one man out of a thousand who knows how to properly prune a tree. If you were to look for a real expert tree surgeon in Des Moines, I suppose you could count them on the four fingers of your hand, and keep the thumb out of sight. It is this lack of expert knowledge of how to handle trees that we must recognize, and then ask ourselves the question: How can this condition be changed? We all know in a general way the advantage of trees. Perhaps all of us have not given the subject as much thought as we should. People generally perhaps do not know how much we do owe to trees. We all know in a general way that trees are beautiful. We have been told in a general way that trees are healthful, taking up the carbonic acid gas and giving out oxygon, etc. They take up moisture from the soil and evaporate it in very large quantities. I understand that the average full-grown tree in the hot season takes up somewhere about 175 gallons a day; a thousand, therefore, would evaporate 175,000 gallons. You may take it that in the city of Des Moines, you have more water pumped by your trees in that area than you pump into your mains by your water works.

We know these things, and the only question is as to how best to preserve them, and we must understand and realize that it can only be done by some central authority, which will maintain a uniformity of tree planting, and select useful and hardy trees and discard the inferior trees. It is useless to plant a rapid growing tree for

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mere shade, when we can plant elms, ash, hackberry, oaks, and trees of that variety.

It seems to me, for all these reasons, this matter should be left to the park commissioners, or to superintendents of parks and public properties in cities doing business under the commission form of government. They should have absolute and exclusive control of planting the trees and the care of them, to maintain them, prune them, and, where necessary, remove them, because removing trees sometimes is absolutely necessary. The trees are liable to be bunched together, 10, 15 or 20 feet apart, and the trees cannot maintain their symmetry or beauty. It is necessary therefor for some central authority to have absolute, complete and conclusive control over them. In our present condition throughout the state of Iowa, trees have been planted for a good many years and some of them fairly well cared for; some of the streets are beautiful, and some are ugly. Many of them are injured from time to time—some by animals and some by injurious pruning. These trees need prompt and skilled attention. Many an old tree now standing, worth perhaps $100 to the locality in which it is growing, is dying, because of some diseased member running down into the heart of the tree, which tree could be saved with proper attention, by a skilled tree surgeon removing the decayed parts, and filling up with cement or something to prevent further decay. This work can only be done successfully and in a uniform manner by some central body having charge of the matter, and having skilled people to do the work.

Another matter will confront us probably in the near future, and that is the foliage of our street trees. The moth has been ravaging the trees in the east. We will unquestionably have this pest later on. This will require a special equipment and can only be done by some central authority, having properly equipped men and accoutrements to do the work. This manner of managing our trees has been worked out in other places. I do not remember just how many states have laws granting the cities the power and control over street trees in this manner. Connecticut, New Jersey, Massachusetts and Minnesota are four that I know of in particular that have given out printed information on the subject. Various cities have acted under this state law, such as Newark, New Jersey, Hartford, Connecticut, and Minneapolis, Minnesota, and are taking care of them in this manner, and with splendid results. If we could take the matter up in the state of Iowa and have it under the park control in that way, in ten years time we would so transform tree planting in our various towns that instead of being places of the

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"City horrible" example, they would be illustrations of "The city beautiful."

I have probably taken up more time than I ought to. It seems to me it must be apparent to everybody that such a law must be beneficial. In Sioux City we have the city government under the commission plan. I happen to be a member of the council and have in my charge the Department of Parks and Public Property. In Sioux City we own our water works; that also comes in my department, and my time, therefore, as you can see, is pretty well taken up, but if the cities are given this control over the street trees and this extra work is added to my department, I would gladly work nights and overtime if I can do something along that line to help our good old friends, the trees.

THE PRESIDENT: This is an important question, and I think we ought to hear from others.

MR. MOFFETT: I had the privilege of visiting my old home in New York City a year ago last fall. I took particular pains to see the beauty of those sections where I used to play when I was a boy. I was so delighted, that I brought home a pocketfull of scenery, which I wish I had here so you might see it—those grand maple trees, with their limbs all kept up in shape. I also went down to New York City and had the privilege of going up on the hill which looks over into New Jersey. I spent a half a day or more on that beautiful side-hill, and had my lunch along.

It seems to me if we had a good many of those views distributed here among our people, it would help us to stimulate the people to taking more interest in the beauty of those things. I want to say to you this is a very interesting subject and hope we will get enthused over it.

THE PRESIDENT: We have the Park Commissioner of Cedar Rapids here, Mr. Reed, and I hope he will be able to add something of interest.

MR. REED: I feel that I am too new in the business to give you any enlightenment on this subject. I was appointed to fill a vacancy about five months ago, and most of my time has been taken up in absorbing knowledge, and that is what I am here for today. I think some of the men who have had a longer experience should take up this discussion.

THE PRESIDENT: We have an ex-park commissioner here from Cedar Rapids, from whom we would like to hear, Mr. Krebs.

MR. KREBS: I wanted to make a little comment and I wondered when Mr. Wilson quoted that extract, "Woodman spare that tree,"

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which by the way, inspired most of us, why he and Mr. Healy did not say something about the effect on our trees in the cities by the acts of the public utility corporations. I had an experience in front of my house with elms. The electric light people were stringing wires through them. I asked who the foreman was and spoke to him about it. He said, "Well, Mr. Krebs, the trees of this town are quite hard on our wires." I told him that sounded good from the standpoint of the owner of the trees, and that I would say, the wires were mighty hard on the trees.

I do not want to speak of it in a boasting spirit, but I never am sorry that I was instrumental in planting two rows of maple trees in Ellis Park, and those surrounding Redmond Park. We were the first Park Board and took the land in a raw state and made it look like a park after a while. They said: "My goodness, plant maple trees; what are you thinking about? You will have to wait a life time for results." I said, "never you mind, there will be Park Commissioners after we are dead and gone."

I think the old gentleman struck the keynote, when he told us we ought to circulate the pictures of what is being done down east. When I was in Providence, and Bridgeport, Connecticut, and saw these long lines of elms, uniform in size, well selected, and properly cared for—not as Mr. Wilson said, squatty boxelders, etc.—I wondered why it is that this rich state of Iowa does not do something creditable in the way of planting trees around these grounds.

THE PRESIDENT: I have the pleasure and also the regret of presented greetings to you men from one whom you all know very well. He has been with us so many times; he is certainly a veteran in the service. But he is not able to be with us at this meeting. I speak for Professor Macbride, who is a Park Commissioner at Iowa City. Permit me to tell you gentlemen, that we will have one of the prettiest parks in the state, and we owe this largely to Professor Macbride. Really, it is not necessary to present his views in detail because they coincide almost exactly with those Mr. Healy has expressed.

His recommendation is that Park Commissioners be given control of tree planting and of beautifying the streets. In Iowa City only one street is under the control of the Park Board, and that by common consent. But there has been constant doubt on the part of the members of the Council and Park Board as to the extent of their power and authority. Professor Macbride's recommendation, as a Park Commissioner and an old friend of trees and everything

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that is beautifying to our surroundings, is that the control of the streets be placed in the hands of the Park Commissioners, wholly for the purpose of giving continued benefit of expert service in this kind of work. The people need education. One of Professor Macbride's experiences will be interesting in this connection. A road was opened on the south side of our park, half of it being given by the park and half by the adjoining property owners. The trees in the road on the park side had to be cleared away. A gang of men was sent to do this and they cut over the line. Professor Macbride, seeing this, said: "Hold on here, don't cut over the line." One of the men said: "Why, we thought you are going to cut all these trees down and make a park of this!" The fact is that many people do not understand these things; they need education.

I wonder if it would not be a good idea at this point to recommend that the legislative committee urge legislation along this line by our next General Assembly. Is it the desire of this body to so place itself on record? If so, we can dispose of this very quickly.

MR. SECOR: Secretary Greene in his report recommended something along this line, and I happen to be one of the committee on the Secretary's Report. It is our intention to bring this matter before the Horticultural Society later in our report.

THE PRESIDENT: The only thing that needs to be done here is to put ourselves on record. Would there be any objection to the joint meeting doing this?

MR. SECOR: No.

MR. BOMBERGER: I move you that it is the sense of this organization that the next General Assembly should enact laws which shall place the planting of trees and beautifying the streets and the planting of trees along the streets, in the hands of the Park Commissioners and park boards, and that said laws shall also provide for the protection of these trees from destruction by public utility corporations.

The motion was duly seconded by Professor Erwin and carried.

MR. EVANS: This is the first time I ever met with you gentlemen in the city of Des Moines. I am practically speaking a tree destroyer. I am converting upwards of 4,000 trees into lumber; at the same time I have been a tree planter all my life time, and I have experimented upon recuperating diseased trees. I think most of us understand that whenever the tramping of cattle goes to the extent of killing the grass, the trees do not live long thereafter. I

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have taken an old-fashioned potato fork and stuck it into the ground, left the holes open, and soon noticed that those trees made a growth 50 per cent better than those that were not treated that way. If you will loosen the ground around such trees, even though they are already diseased, they will soon come to life again.

THE PRESIDENT: We will now resume the regular order of the program. I assure you that I will not take much time in discussing "The Future of the Park and Forestry Movement in this State."

I think all of us will agree that there is a certain laxity of interest in this movement. None of us feel that we can take the initiative. Many of us do not have the time, and besides, there has been the feeling that a question like this is not one of considerable importance, because we live in a prairie state, and consequently the question does not concern us very much. As a matter of fact, it does concern us in many ways, and the lack of interest we have found in the state is due wholly to the fact that the field of our efforts has been too restricted. The opinion has prevailed that what we were after was to develop forests in the state. We have felt that there were other phases of the question, such as fruit tree planting, ornamental tree planting, and both of these have come more or less within the province of the Horticultural Society. The Agricultural Society has taken care of the shelter belts, and we have talked about school grounds, and the teachers have taken up the question of the care of these; and so there has been a division of forces. The different phases of the question have been taken up by various organizations, each independent of the other, with the result, that there has been a sort of a ragged interest all along the line.

What must be done in order that there may be a livlier interest is to inaugurate an educational campaign. Twenty years ago, most of us can remember very well what attitude the farmers assumed towards the questions which now are included under scientific farming. If a man suggested anything of the kind, he was considered visionary and they laughed at him. Nowadays you will find our farmers intelligently discussing these scientific questions. They have learned that that which is truly scientific is truly practical. That it is simply bringing to the use of men that which is the best, that kind of knowledge, expert knowledge, which is practical. Farmers will today talk to you about subjects that the farmer twenty years ago would not have understood at all. The subject

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of the condition of the soil, and what is necessary to improve it, will bring out terms which the father of the present-day farmer would not have understood. The intelligent farmer, the average farmer, can now discuss these things intelligently, because there has been a campaign of education along these lines. That sort of a campaign, such methods of education should be taken up and brought within the province and scope of these organizations. We attempted an educational campaign a year ago by trying to interest the papers of the state. Some of them responded nicely, some quietly threw the stuff in the waste basket, and in a few instances we were told we might pay for the publication of it! So that the attempt to interest the newspapers in that way was not successful. Newspapers do not usually lead in a new movement, but usually respond to the call of the multitude; they are followers in many cases, rather than leaders. The paper usually does not take hold of these things until the people take hold of it. When the subscribers want this information, the newspapers will furnish it.

I would suggest that the very fact that we have these varied interests that may properly be included here, and which have led to a division of forces heretofore, ought to give us strength, if we can bring them together. We have just discussed a subject of great importance, the park proposition—a growing proposition. This is not going down hill; it is growing in interest. Every town and village in the state will have parks and will be interested to know how to control them. Every town and village has its streets, and every country district has its roads and the people of the country communities will be just as much interested as the people of the towns. There will be county parks, township parks, perhaps, throughout the country.

Then we have the question of school grounds. The great majority of school grounds in the state are an abomination and an eyesore. I can speak particularly of the school grounds of one city in the state. The present school board has been trying to improve these grounds. The grounds are inadequate, and in one case they tried to get the use of a part of a small park near one of the schools. One of the councilmen who lives nearby happened to have trouble with some of the school boys and as a result the children are barred from the privilege of using an otherwise useless piece of ground.

I think the question of public playgrounds and school grounds can be readily combined. We happen to be so situated at Iowa City that we could easily do it if there was just a little more in-

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terest. But we have too many officials concerned, and it is hard to get them to work together. If we didn't have so many methods of running our government, we would succeed better.

And then there is the question of treating the borders of our farms. We have a suggestion over yonder on the table (referring to the nut display) that might be carried out in these borders. We have here an important proposition, a question which I wish to discuss this evening, the question of protecting farm crops by shelter belts. I have been laughed at at times, in a good-natured, friendly way by thoughtless people when I have urged it. Yet, I have found pretty good authority in support of my own view, and, moreover, it has been established by experiment. Good old Judge Whiting published years ago in one of the reports of the Horticultural Society a statement that the planting of shelter belts for the protection of crops alone pays, and the time will come when we will look upon shelter belts in an entirely different way from that in which which we view them at present. It is necessary for people to have information along these lines, and we ought to make an effort to bring together all the interested organizations for this work; we ought to go before the teachers' organizations and ask them to discuss the question of school grounds and play grounds; we ought to go before the agricultural associations and ask them to discuss the question of shelter belts for the purpose of protecting the crops, and get them to look at the matter from the really practical side. It can be absolutely demonstrated that the planting of shelter belts pays. We ought to go before all these organizations and undertake an educational campaign that will make people demand improvements along these lines. In this way alone can we succeed in the end. We cannot expect a small body of men to cover the entire subject, and we must arouse interest in every community to bring the attention of every one interested in public affairs to these matters. There are many people today who are lax in interest, who are good-natured and agree to anything you say, but who will turn out and work and fight if properly aroused. Look at the great improvements in the agricultural industries of the state, which have been made possible because of the educational campaigns of the past few years. If we adopt this policy and carry it out, the horticultural and park and forestry phases of this great field will receive better attention. We will then have less complaint to make of our treatment of the opportunities which are given to us. I believe it is time for us as individual organizations

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to undertake an educational campaign just a little more vigorously, and to see to it that every one of us will become a nucleus around which we will gather strength and power, and if we do this the time will come when it will not be necessary for men to stand in meetings of this kind and complain of a lack of interest.

MR. MOFFETT: I put out two years ago 100 evergreens on the north and west of my place, just big enough to make a beauty spot there by and by when I am gone.

THE PRESIDENT: We have another subject before us, "Forests Along Our Rivers," by Prof. G. B. McDonald, Ames.

FORESTS ALONG THE RIVERS OF IOWA.

PROF. G. B. MACDONALD, AMES.

There are generally three periods in the development of forestry in any forested country. First, the period when timber resources are considered inexhaustable,—a period when "forestry" is an unknown profession, when the timber is exploited for the financial benefit of a few and to the detriment of the nation, a period which is characterized by unpardonable waste and lack of foresight. The second period, or the time when the people come to a realization, at least in part, of the value of the timber resources, not as a product to be mined and done away with, but as a living, growing crop which requires protection and scientific treatment. The third period, in which steps are taken as a nation or individuals to place the forests on a permanent basis, to regulate the crop of wood, so that the annual or periodic consumption of a given area does not exceed the amount of timber produced in the same time.

Our country has entered the third period in its forestry development and is pushing forward at a tremendous pace. We have the advantage of being able to profit, at least, in part, by the mistakes and experiences of European countries. The National government with its large areas in national forests will go a long way towards solving the forestry problem, but not entirely by any means. The numerous laws which have gone into effect and the circulation of forestry literature has and is producing its results. However, the tendency has been to stimulate the production of new forests or woodlots rather than to encourage the protection and proper use of natural timberland.

In well ordered districts the soils most fit for agriculture should be used for the systematic production of food crops, but just so should the non-agricultural and poor lands be used for the systematic production of timber crops. It too often happens that the non-agricultural land is to be classed as absolute waste, when, with a little knowledge and proper management, this class of land could be made to become a source of revenue. Even in the agricultural states such as Iowa there exists considerable

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areas, in the aggregate, which can not be used for agricultural purposes. These are the lowlands bordering the streams—the present flood plains of the water course, which during a part of the year are submerged, a condition which prohibits their use for agricultural crops.

Then again, the steeper slopes and rougher land bordering streams is essentially absolute forest land. Both types of land just mentioned are frequently wooded but in most cases, they are of little commercial value. In places the forest remaining is the cull of the former forest resulting after the most valuable species have been removed. The cuttings were made with no particular thought as to a future crop, the valuable timbers were taken and the less desirable trees and "forest weeds" left. With such treatment it is not strange that the present natural timberland is in a more or less non-productive state. Another factor which is tending to keep these timberlands from becoming highly productive is that of pasturing. It is a difficult proposition to practice forestry and raise stock on the same area. If heavily pastured, there is but little chance for a partially wooded area to become fully stocked by natural reproduction. The young seedlings will be tramped on if they escape being eaten. I understand that at one time practically one-fifth of the area of the state was wooded, but it is safe to say that the present population of the state would be sadly in need if it depended solely upon its forests for lumber products. Not only is there a small amount of timber ready for harvest but the percentage of growth capable of producing desirable material naturally, is very small. Many square miles in the state bordering the streams may be properly classed "woodlands," but nothing more. The composition and condition of the forest growth is such as to have no significance as regards lumber supply for the present or near future.

In the uncared-for or virgin forest the production is always much smaller than in the forest properly managed. In the former the product has been obtained with a maximum waste of both time and acreage.

The poor quality and small extent of the forests still bordering the streams of our state should stimulate an activity on the part of the people towards preventing the further depletion of such wooded areas. In many parts the forests have deteriorated to such an extent that under the best of treatment they would not right themselves naurally within any reasonable length of time. Take for example almost any part of the state where the thriftiest and most valuable trees have been removed. The poor species, being left as seed trees, take possession of the ground and will keep possession unless the owners of such tracts go to the trouble and expense of making artificial adjustments. These adjustments should comprise improvement cuttings, thinnings, breaking sodded patches of soil, preventing the admission of live stock, and last of all by sowing seed or planting trees if necessary. In the improvement cuttings the "weed trees" and less valuable species should be cut out gradually and in such a manner that the desirable species will be able to gain an advantage preferably the cuttings to be made during the good seed years of the better trees. A valuable tree takes up no more room than a worthless one, and therefore all the trees which are over mature, decaying and crooked should be removed as soon as possible without opening up the

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stand to such an extent as to cause the drying out of the soil or the admission of grass.

Much of the timberland might properly be called parks. The rapid opening up of the stand has caused the formation of a tough sod cover for the soil which is very effective in preventing the germination of seed and the restocking of the land with a growth of reproduction. Breaking up such sodded areas means a considerable expense and the average land owner prefers to allow the productive capacity of the land to remain in a crippled condition rather than to go to the trouble and expense of assisting nature to her feet. The reason for this is clearly seen. The ordinary individual can not see dollars and cents in returns, at least for a considerable length of time, and does not care to be philanthropic to such an extent as to allow a succeeding generation to reap the benefits from his outlay.

Large areas of the wooded land along streams are used as pasture. If asked why he did not grow trees on the timberland instead of pasturing stock, the farmer would reply that he needed the land for pasture because he could not devote the more valuable parts of the farm for that purpose. It is well known that satisfactory forest reproduction can not be secured on heavily grazed areas. It is also true that the best grass land is not found in a stand of timber. Therefore it might be well in the case of grazed woodlands to cut the timber on a part of the area, thus allowing the better production of forage, and to exclude the stock from the balance of the timberland. In this way the farmer would be supplied with equal forage and at the same time the whole woodland would not be kept in an unproductive state.

In an attempt to improve the quality of timber on lands where poor species have taken possession, other than the original species might be tried. As for example, an open stand of inferior hardwoods might be underplanted with some coniferous species. I have in mind the white pine, a fairly rapid grower, which is tolerant of considerable shade when young. In its native habitat the white pine produces a good quality of of timber in mixture with hardwoods.

On the grounds of the Agricultural Experiment Station a small amount of planting of this character has been done. The area included in the experiment consists in a steep slope bordering the creek. The hardwoods occupying the ground are small and the stand open. The white pine trees were planted with a spacing of 6x6 1-4 feet. Later on as the pine becomes more insistant in regard to its light conditions, the original hardwoods may be removed, thus giving the pine a chance for its best development.

Forest planting in this state is not a difficult undertaking. The climate and soil conditions are decidedly favorable for tree production as compared with many parts of the country where the National Government is attempting reforestation. A tree which is planted with any reasonable degree of intelligence on the part of the planter, may be expected to grow and produce returns.

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A question naturally arises: Can the individual make sufficient money on the investment to pay him to practice forestry?—that is for the production of saw timber. In general it may be said that the people of the state consider it a function of the Federal and State Governments to provide the large saw timber for the future; because of the nature of the investment, private capital can not afford it. In spite of the growing scarcity of good saw timber, and the resultant increase in stumpage prices, the planting and management of timber for commercial purposes has not appealed strongly to the people. Notwithstanding the large acreage in State and National Forests, over seventy-five per cent of the forested area of the country now remains in private hands. The proper management of the timberlands within the National and State Forests would by no means insure the supply of timber for the future. It has rightly been said that the future timber supply of the country depends not so much upon the State and National Forest as upon the efforts and invested capital of private individuals.

The average person is not willing to put his money into the growing of trees and systematic management of woodlands unless he is able to figure with considerable degree of accuracy the future returns on the investment. European countries have demonstrated, under their conditions of labor, taxes, market, species, etc., that a forest crop can be grown which yields satisfactory returns on the investment. In this country such fast growing species as can be handled on a short rotation, notably trees for fence post production, have yielded a good rate of interest.

Yield tables for different qualities of locality and different stands of timber are practically wanting in this section and it is impossible to determine accurately what yields in volume may be expected from the different types of natural forest land within the State, if such lands were fully stocked. Also in the absence of yield tables it is impossible to determine accurately the money returns that may be expected from various stands at different ages.

The matter of taxation of timberland is one of the chief causes for the withdrawal of the individual from the practice of forestry. The assessment for taxation for a small acreage of woodland, at a nominal price, for a specified number of years, only partially solves the problem with land owner. Even though he is practically exempt from taxation for a time, yet he has no assurance as to how his forested property will be assessed later on.

Until the individual can see to his own satisfaction that systematic forest management pays, there is little chance that the individual timberland holdings within the state will be improved and put on a permanent producing basis.

If the woodlands along the streams are not of such quality as to produce a sufficiently high rate of interest, under scientific management, for the individual,—a rate at least comparable to that which may be expected from secure, long time investments, then these lands should be managed by the State or National Governments. In various other states the departments of Forestry are acquiring title to the poor waste lands by

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purchase or donation. These lands one of such poor quality or in such poor condition as to guarantee only a small rate of interest after a long investment—a rate too small to attract the attention of the individual.

Although in many ways it would seem profitable to have the poor timber lands under state supervision, yet there are serious drawbacks to such a procedure. Iowa has the least per cent of non-agricultural land of any of the states. The waste and timber lands occur in small areas, are more or less isolated and scattered, which would make systematic management by the state quite difficult. However the fact that Iowa has the largest per cent of good agricultural land and only a small per cent of timber land does not excuse us from our share in the responsibility for the country's future timber supply.

THE PRESIDENT: The discussion of this subject is to be led by Elmer Reeves, of Waverly.

MR. REEVES: I don't know that I am competent to discuss as large a question as this and do any particular good. However, I have paid considerable attention to the growth of forest trees, and as a boy helped plant one of the largest forest plantings in the state. I have helped harvest a part of that crop, and I will say, while I do not like to admit the result, because we had hoped for different results, that to the individual it did not pay, and I do not know of a case where it has really paid an individual to grow a large area of forest trees to harvest and sell for profit. I fully believe, and I think the facts bear me out, that it does pay every farmer to grow a small amount of timber for farm use. Many times he will put that to use when he wouldn't if he had to buy it or go to any distance to get it.

On the ground on which we grew these trees, we grew more larch than anything else; also elm, walnut, ash, soft maple, butternut and boxelders. We had quite a variety. Among the evergreens, we had white pine, Norway spruce, Austrian pine and a few others. Two long rows of white pine, I remember particularly, were always admired by visitors. But if those were cut down at the present time and sawed up, they wouldn't pay for the rent of the land, which was rich farming land. I believe that a person owning strips of poor land in Iowa could profitably grow forest trees.

MR. KREBS: What kind of forest trees?

MR. REEVES: Oh, any good, rapidly growing trees. Soft maple is one of the profitable trees, which in our part of the state has been entirely neglected the last few years. It is the best soft wood fuel you can get.

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Now, when the state was first settled, along the streams there was considerable timber. I think the first few years after settlement those strips of timber extended quite rapidly. The fires were kept out, the seeds were distributed more rapidly than before, and if this condition had been kept up, a large part of our state would have been covered with forests. But the farmers wanted to follow agricultural pursuits and what timber is left now is of very poor quality. I know of very few pieces of timber that are cared for in any sort of intelligent way. I have a neighbor who has perhaps 200 acres of timber land; he is continually marketing wood, but only such trees as are ready to market. A tree that is thrifty, vigorous and in good health, he wouldn't allow to be cut. There is one thing he is doing that will prevent his timber land from being kept up very long. He pastures his timber land so that no young trees are starting. I do know one little piece of timber land, perhaps 20 acres, where there has never been an animal allowed to pasture, and if you can imagine the beauty of that little timber spot, you must have seen something like it. There are scattered through it a wonderful variety of flowers, ferns of all sorts, and weeds that are interesting to study. A part of it is rather wet ground, and then it runs up on a ridge which is dry.

We have a little sawmill in our town, and each winter the farmers bring in logs to be sawed; it is surprising to note the amount of lumber sawed at that mill which is cut from natural timber partly, and largely from the plantings made since the farms were settled. I have asked a great many farmers who bring logs there, if it paid them as an investment to grow those trees. They invariably say no. The lumber is of rather low value—elm, cottonwood and so on. I was in a farmer's barn a short time ago. He had made some partitions of cottonwood boards, and had sawed and nailed them up green. Seeing the cracks, I asked him something about it. Oh, well, he said, I have some more trees to cut, and I will have boards cut like these, and put a board between each one of these to fill up.

Cottonwood boards make good lumber when properly seasoned, and are durable, even for use as a barn floor. I believe there are many strips along our streams that ought to be planted in timber and kept in timber.

MR. KREBS Aren't some of the lands along the creeks and rivers too wet to grow timber?

MR. REEVES: Where the land does not overflow to prevent the

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starting, cottonwood and elm trees will thrive. In fact you see many timber tracts on such land as that. It is a little difficult to start the cottonwood seed and get it transplanted. The only way I have ever known a grower to sucessfully grow cottonwood seed, is to prepare a piece of ground near the trees and when the seeds drop, cover them by a slight harrowing, and if weather conditions are favorable, they will grow in abundance.

MR. GARDNER: I only know of one spot that is not pastured. The gentleman who owns it wants it to be as it was when he came there. It will probably soon pass out of his hands, and then very likely the new owner will pasture and destroy the timber he has saved all these years.

MR. REEVES: Our timber in Iowa, while we sometimes speak of it being wasted, has not been wasted to the extent of what it has in the western region. It is a great shame the way timber in this western region has been wasted. It lays there and rots—millions of feet of logs. I cannot understand why it was not picked up when the mills worked in those sections. I saw trees five feet in diameter, and sound, for anything I could see, for even eighty feet in length, that lay there rotting and the mills had been removed, and there seemed to be no chance to use them up. If we had those trees here they would be worth good sums of money for lumber and also fuel.

In Iowa we did not have that quantity of timber and the waste was not carried on to that extent. In the Minnesota timber regions, there is less of that waste, because they go over a given region for a second time. I have been in sections where they had gone over it the third time, picking up what they skipped the second time. All strips of land in Iowa which are rather steep and of little use for pasture, ought to be in timber. But whether the individual can do that profitably, I very much question.

THE PRESIDENT: I was in hopes we would have a lawyer here, but perhaps one of the Professors can answer the question. I want to say that away back in the last of the '70s, up in our county we voted on a herd law and it carried in our county. No man had any business letting his stock run at large. The question is, what has become of that law? Last year I was on the grand jury, and I took occasion one noon hour to bring it to the attention of the Judge, and asked him what had become of the law. He said it was in full force and effect now.

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Now, sir, right in sight of my place there are at least 200 acres of first bottom that has been cut off, and overflows almost every spring, but it is bare. There are always two or three people who have more stock than they ought to have, and they keep this pastured down. Now, if you can absolutely settle the fact that the law is in force now—every foot of that bottom land will have timber in the next ten years which will make it worth 100 dollars an acre. I know a strip opposite me 10 years old, I warrant you it has 5,000 good willows you could make posts out of. You talk about catalpa for posts; a willow discounts it all to pieces. You can treat a post by the creosote process for 10 cents, and the Government at Washington says it will last at least 20 years. What do you want better than that?

MR. REEVES: Who owns that land?

THE PRESIDENT: That land is mostly owned in small lots.

MR. REEVES: It is up to the owners; there is no question about that.

A MEMBER: I believe Mr. Langham has brought up a subject that is in line of what we are trying to do in our town regarding the meandering line of the stream. I imagine the meandering line includes a good deal of this bottom land. The meander line was supposed to be the high water mark of the river, and the low land next to the river was not supposed to be valuable. I imagine this low land Mr. Langham speaks of still belongs to the river.

MR. REEVES: That might possibly be. But these people cut off that timber and they own that, and no one has questioned that for years and their right to that cannot be disputed on the ground of the meander line or any other question. I am quite sure they can forbid the owners of these cattle to run them on this land. We have had the experience of people pasturing along the road. We have had that old state herd law, and we have a state law now that covers that ground. I do not think the meandering line will apply to this particular case.

MR. GARDNER: In my travels through the state of Iowa, particularly in the northern part, I find that nine-tenths of the farmers' fences run on the line, and there is once in a while a place where they come on the river, as in the case of the upper Cedar, and the fence stops on the river bank, but right there for miles and miles the farmers run wires across, and every farmer does nearly all his pasturing on the ground you want to reclaim for forests. It looks to me, from the trend of the discussion here, that

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the people of Iowa sadly need education in some respects. You know how difficult it is to keep the Iowa man from pasturing his orchard. How then can you expect to drive them out of their timberland? You can not keep their stock out of their orchard. That doctrine has been preached to my certain knowledge for the last thirty years.

MR. TANNER: I live near the Cedar river, and the water line there runs from a few rods to a mile. It is out of the question to fence that ground so that it will hold. There is a class of citizens along that river, sometimes called brush rats. They have a few cows which they let run in there. I heard one of my neighbors say that he would stop them, but he was afraid if he did he would be burned out.

MR. FORSTER: These papers and talks are very interesting. But it seems to me we overlook a great many things along this line. We have heard it stated by the President as to the advantages our farmers have over their forefathers. This is not only true with the farmers, but it is so in every occupation or profession. We have got to keep abreast with the time. Take the farmer of today, he has direct communication with everybody in every part of the state, not only in the state but the adjoining states. We have our telephones; we have our street cars; we have our public graded roads; we can enjoy the same things many of the town people have. Instead of the old system of farming, because of the advancement of prices, we have got to farm on a scientific basis now and keep abreast with the times. We see these things all over the country; we have to give our forefathers credit for what they did, because they thought they were doing the best they could.

I am in hearty sympathy with this park subject. We talk about the timber land. I was raised in a timber country. I can chop right and left handed; never seen many men I would throw an ax for. We have lived in a land covered with timber and where milk and honey flows. I had the privilege of going to Colorado this summer, where I saw some beautiful scenery. Yet I came home better satisfied with my location in Monroe county. Why? I have timber, water and pure air and a black diamond underneath me. There is nothing more beautiful than the timber in its natural state. I want to say, that in planting timber along the streams and other places, you want to prepare the ground first and plant the trees where you want them to grow. Take the walnuts, hickory nuts and plant them where you want them to grow.

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MR. GARDNER: Do you know of any timber land in your vicinity but what is pastured by somebody?

MR. FORSTER: No, sir, I do not. In our country, we have a great deal of trouble in keeping what we call the sprouts down. I have been figuring on getting a lot of Angora goats. My wife says not to get them; they will climb and trim the trees too high. The trouble is, I cannot keep the brush down.

MR. BOMBERGER: This subject has to do with streams and the forests along the streams. There are a great many streams in this country that run through farms, and there are banks along these streams that are entirely worthless to the farmers; they bring no revenue whatever. I have in mind farms in which there may be from three to fifteen acres that practically are unused. That land is just simply caving and washing, and absoltuely worthless. I would like, if I could, to draw a picture, where a stream was all skirted with artificial evergreens. I have in mind a farm, the owner thereof was something of a horticulturist, in fact a kind of an enthusiast, and he had a very poor building spot. He planted between the road and where he really had to build in such a way as to see the residence location across this belt of trees—one of the most beautiful farms in western Iowa. I think we should encourage people to go into these kind of improvements which will in the end add considerable to the value of their farms.

MR. PATTEN: I wish to dissent somewhat from the thought presented by Mr. Reeves that plantings in a large part of Iowa cannot be made profitable. There is another side to this question, besides simply dollars and cents that can be gotten out of trees after a certain number of years. In three-fourths of Iowa there are perhaps hundreds of farms in every county, that, had they 10 acres of land well planted and managed about the home—planted to the kind of trees that we now know are valuable, there is no question but what one-half of the value of that planting for a period of 25, 30 or 40 years, might be placed to the credit and comfort, and benefit that accrue to the stock and the home upon that land, as well as benefits to be derived from the other crops planted on that farm from such a planting. If 10 acres were used and the smaller growing trees were planted about the building, such as Ash, Hard Maple and the larger trees a little further back, and evergreens still further back, and the smaller evergreens, like cedars, planted in the extreme part of the ground to protect until such time as the timber trees are cut, treated in a scientific

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way, as they treat them in the old country, there is no question but what such planting can be made to pay in dollars and cents to the occupants of such farm. I have just such a planting in mind in northern Iowa, and any man who would see that planting, if he wished to buy a farm, would add one or two thousand dollars to his estimate of the value of that farm, to one where there are just a few scattering trees. Whenever any of you gentlemen come to Charles City I would like to show you a little planting of timber trees made some 40 years ago, it would almost make you believe that timber planting from a money value can be made to pay.

THE PRESIDENT: There was a question asked a while ago that concerns lawyers. I am not a lawyer, but have had a good deal of experience with meandering lines. There is such a difference of opinion as to what constitutes the proper line and what constitutes accretion to land and as to what is the meandering line and what force it has. The streams in upper Iowa are not meandered at all. But where streams were meandered, there has been considerable dispute as to what constitutes the actual boundary line.

In years when it was a part of my business to look this up, I found it impossible to give any definite opinion about it. There was so much conflict in the decisions of the courts. It seems, in each case the question was decided rather on its own merits covering the particular case. In some cases accretion was cut off and in others it was decided to be a part of the property. I know the question is a difficult one. The difficulty along the Cedar River is, those property owners that own that land do not live near by.

Prof. McDonald says that 1-5 of the area of the state was covered with forests. That is too large. I have gone over that carefully in the old Andrews Atlas, and even that gave it a little larger than the original Government Surveys, but makes it no more than 1-8. It has been put as low as 1-17, usable timber.

The next subject on the program is entitled, "Public Playgrounds," by W. M. Krebs, Cedar Rapids.

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PLAY GROUNDS FOR IOWA.

W. M. KREBS, CEDAR RAPIDS.

Using the Hon. Sidney Foster's motto, that: "In all that is good Iowa affords the best." Let us now proceed in the play ground propoganda in a manner that indicates we mean to make good.

When man forgets how to play—man should prepare to die.

The play ground scheme as now organized and directed is of comparative recent origin in this country, but has been promoted in the old world in various forms for many years, though usually taking the form of indoor gymnasiums. London leads the world with over three hundred play grounds, in some instances using old church yards and cemeteries. It is interesting to note that the first plat of ground for such use was donated by John Ruskin.

Frobel, a student of childhood says: "Through play we develop a cheerful disposition and a sunny temper. Our first duty to a child is to make him happy. Happiness comes through play; happiness makes a cheerful disposition chronic and builds a disposition for life-long cheerfulness and a happy disposition makes a sunny character."

To this, we all subscribe. The play ground will prove conducive to the building of healthy bodies, healthy minds, healthy social conditions and a higher order of citizenship. Their influence on boys is described by a policeman as follows: "They used to be a tough gang but now they don't give me no trouble."

Another said of a group of 500 boys that were under control by a director, that it would take a good number of policemen to handle them if running at large.

Here in Iowa, we know as yet, by practice and experience, very little of this great movement. No later than 1901 or 1902 Mr. H. E. Downer of Davenport in a splendid paper on play-grounds read before the Contemporary Club, used these words: "Perhaps the time is not yet ripe for the consideration of this great subject," and the fact that we have had to wait ten years to see a substantial beginning indicates the truth of his statement.

Davenport is making a strong lead, and having seen the equipment in the High School gym, I am convinced that the people of that city are willing to spend money liberally for such purposes. The Bohemian and German citizens of our state lead in these matters—much to their credit.

The failure to make room for play has made havoc in many ways and is no doubt responsible for many of the errors of youth. We are not unmindful of the command that: "In the sweat of thy brow thou shalt eat." But, this may be overdone. We call to mind an example: Visiting a wealthy farmer in eastern Iowa, I noticed a boy coming from the field where he had been plowing, at sundown. I noted the program. He helped with the milking after supper, and the chores until 9 o'clock, and the next morning he was the object of gibes for falling to sleep while milking a cow, having been called at four o'clock. And, this boy was

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not over eleven or twelve years of age. This was indeed a sample of strenuous life, not uncommon, and I believe the cause of so many boys leaving the farm.

In Cedar Rapids, we have made a beginning,—thanks to the Women's Clubs of our city,—through the co-operation of the School Board and the Department of Parks. As an experiment we have installed a giant stride and toboggan slide, tennis, basket ball, etc., on two of our school grounds with sand pits and other minor appliances. We feel much encouraged by the result of this trial and will extend the work next season as fast and as far as funds can be obtained. Just now we are providing skating in several good locations.

Our Woman's Club did a great amount of planning and hard work and provided a large corps of volunteer workers who directed the drills in a very satisfactory manner.

The old park board some years ago, installed in Riverside Park of some ten acres, which is only five minutes walk from the business center, quite extensive out-door athletic apparatus at a cost of about $1,000.00, which has been much appreciated by the general public.

Plans for a public bath house at this park were procured at that time, but on advertising for bids we were cautioned by the engineering department that on account of some private sewers emptying into the river above the proposed site for the baths, would in all probability render the conditions unsanitary. Much to our regret these baths were abandoned. But, another location may be selected and the good work pushed to completion soon.

The splendid bath houses established by Dr. Chalge, of St. Paul, which are so largely patronized by all classes of people, shows the value of public baths.

But again the play ground. All animal life shows the tendency instinctively to play, and the same instinct is inherent in every healthy boys and girls, but they must be guided and instructed and directed, else the howling mob may overwhelm the helpless little teacher who is trying to tame them to moderation and the proper and safe use of play ground apparatus.

Boston with her Joseph Lee, the father of play grounds, has set the pace. She long ago had ten floating bath houses. She had the first outdoor gymnasium for women. A Massachusetts law makes it compulsory to give voters an opportunity to decide whether or not they want play grounds, in all cities of over 10,000 population—result—forty out of forty-four voted to maintain such play grounds. Also, in 1895 a law passed authorizing school boards to use school premises for play grounds, and provide for their maintenance.

In other cities much has been done to further the work. In Rochester, N. Y., the play grounds are under the management of the Park Board. These were organized in 1902. Buffalo has a good system of play grounds and rightfully and wisely makes provision for the big boys and girls who have work in shops and factories and stores to have the use of these grounds after six o'clock P. M.

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Los Angeles leads in making a very liberal provision for such grounds, —the commissioners erecting a public recreation building at a cost of $50,000.00, and in 1907, $40,000.00 was appropriated for play grounds. An important feature of the work here is that on each play ground a residence is provided for the supervisor in charge.

New York has her Jacob Rus, who has done so much for the waifs and who has shown us in his illustrated lectures how much woeful neglect there is in this selfish world, of the children and youth of our great cities. He shows us the need that we wake up and be doing. The statistics adduced by our courts and judges go to show that the play ground is not a luxury but a necessity and show us the enormous reduction of the number of arrests after play grounds had been established in certain districts. The street is a mighty poor place to bring up a boy. The good effects are a minor quality in the street school.

But Pittsburg, best of all yet, turns from its one-time chief industry of coining dollars out of iron and now provides more liberally than other cities for its play grounds. In 1908, $100,000.00 was appropriated,—the Council seeing the value of the movement which in the minds of many students of our social problems is aiding in the solving of perplexing labor questions in our crowded cities.

The great procession in 1908 at Schenly Park, Pittsburg, at the close of the summer consisted of 3,000 children from babies up. The drills and salutes being a prominent feature. The Pittsburg play ground congress in 1909 was a notable event, aiding largely in promoting the spirit of play, and making this movement well nigh epidemic all over the country.

In closing, I would suggest that there should exist in the civic organizations of all our cities the most generous spirit, so that there may be the utmost co-operation of the council, the school boards, and the Women's Clubs in procuring as rapidly as possible the achievement of this most laudable enterprise in our much loved state of Iowa.

THE PRESIDENT: The discussion of this paper will be led by Mr. Eugene H. Taylor, Cedar Rapids.

MR. TAYLOR: I do not want to scare you by the things I have here. There is so much to this subject, that I brought some material along to refer to if there is time.

I can only touch on a few of the points that I think need to be impressed, to start your thoughts. I believe it should be remembered that play is one of the important things in life. It is a business for the children and it must occupy a good deal of their time for their proper development. It is not only an aid to health, but helps to develop the higher social interests. On this subject, Ex-President Roosevelt said:

"In such a republic as ours, the one thing we cannot afford to neglect is the problem of turning out decent citizens. The future

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of the nation depends on the citizenship of the generation to come; the children of today are those who tomorrow will shape the destiny of our land and we cannot afford to neglect them."

Cedar Rapids a few years ago took up the matter of city improvements, and Mr. Robinson, who, I think, was also employed in Des Moines in the same line, in his report shows this picture of a part of the city that is an eye-sore—vacant property and suggests that it be made into a play ground, as it can be with very little equipment.

Now it occurs to me, that it might be well for our schools to start the education that is necessary along this line, the same as in the other lines spoken of here this morning. Education in all these things seems to be of a very low grade at the present time. Therefore, would it not be well for our State Normal School to include in its curriculum instruction for the teachers which it turns out, on this very matter of play. The child needs to be directed and told what to play and have general oversight. Now, if the Normal School should take that in hand, would it not be work in the right direction? In the Agricultural College and State University, and all through the graded schools should there not be attention paid to education along this line?

Reference has been made to the boys on the farm and the social life there. Now, in New York state this work has been taken up and they have there field days and festivals. They have been doing a great deal of work in that way to help these outside districts along the line of play and have stimulated this social development which may keep many on the farm who now go to the cities. So there might be county and district field days and festivals that will bear fruit along this line.

The Y. M. C. A. workers could also take up this work. In Cedar Rapids some of the graded schools have, what I think they call Mothers' Clubs, looking after the interest of things in their particular district. Why couldn't these Mothers' Clubs take hold (if the school board will not or cannot,) and equip the grounds with apparatus and planting, raising the money among the neighborhood individuals without waiting for the school board to take up the work. In England I think it is a law now that there shall be at least 30 square feet of play ground for each scholar for each school building. How many schools in our towns have this provision? They are the most barren places; there is nothing to encourage the scholars. I have here a plan of a little lot 50x80 that a

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city had fixed up as a playground, and I think it cost something like $150.00 to equip it. How many vacant lots are there in the city that absolutely grow nothing but weeds which could be thus used. Of course when there is a necessity to build on these vacant lots, they would have to move the play grounds to different places. There is room and a crying need for all these different things.

One more point is the location in regard to distance. It seems to be an established rule by those who have given this thought, that a circle a quarter of a mile in radius should be struck to locate the playgrounds for the little tots, up to 8 years old; for those over 8 to 16 a half mile in radius, and then outside of that would be the parks and larger places for grown people. Picnic grounds, baseball fields, and things of various kinds that can be put into the city parks, would come outside of that. But if every child can reach a place where it can let off steam in a playground; if there are provisions so that weak ones are not overrun by the stronger; if we did all these things, we certainly would be working towards the end of the declaration of President Roosevelt.

MR. BLACK: At Independence we have three public school grounds and something over a year ago our board of directors was induced to put in a teacher at the tennis grounds and basket ball, and other athletic apparatus on the grounds, and the teacher has nothing to do except to oversee and teach the children how to play and perform in these games. We call her physical instructor. We pay her the same salary as the other teachers get. When it was first inaugurated there was a good deal of fault found, but we found the boys that were very liable to play truant, or have the truant officer sent after them at times, are getting interested in the school work and are being reclaimed. I think it has been the means of drawing them in. I think they will make better men physically, as well as morally and intellectually, by the installation of this new feature. I think this is something that will not drop and we are well satisfied it is an innovation.

THE PRESIDENT: I want to say one word because of an effort made at Iowa City. My chief argument has been on the ground of future good citizenship. The boy today at Iowa City is either run over by an automobile or run off by a policeman if he plays on a private lot. If he goes to the park, he will find a sign up, "keep off the grass". I tried to get a bunch of boys together at one of the school buildings one evening, and I happened to be interested very much as a member of the Board, and when the

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boys saw me coming, because they knew I was interested in an official capacity, they ran like villians. A boy of today thinks this local government is instituted for no other purpose than to prosecute them. I believe they ought to have some recognition, and this is an important question that concerns us in the congested districts.

Before proceeding with the last number on the program I want to announce two committees. We shall have a little business meeting immediately after the program of the florists is finished this afternoon, to attend to a little business preliminaries.

These committees are:

Committee on Resolutions: Eugene Secor, W. M. Bomberger, and Prof. G. B. MacDonald.

Committee on Nominations: William Langham, Elmer Reeves, and G. B. Healy.

WEDNESDAY AFTERNOON SESSION.

(Joint Session with the Society of Iowa Florists.)

THE PRESIDENT: At this session, I will turn you over to the tender mercies of the Vice-President of the Florists Association, the President, on account of sickness, not being able to be with us.

Vice-President J. T. D. Fulmer assumes the Chair.

THE PRESIDENT: We all regret it that our President is unable to be here this afternoon on account of sickness in his family. We will however carry on the meeting according to the program. We should have had an address by the President, but on account of the condition I have mentioned, it will have to be omitted.

The first number on the program will be "Planting and Care of Hardy Bulbs", by K. H. Guthrie, Des Moines.

THE PLANTING AND CARE OF HARDY BULBS.

K. H. GUTHRIE, DES MOINES.

Bulbous plants are divided into two general classes and classified as "Spring Bulbs" and "Fall Bulbs."

There are certain bulbs that are suited best for spring planting and others for fall planting.

It is to the latter to which my paper will be confined.

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If people generally knew how easy of culture hardy bulbs are and of the rare pleasure one derives from these early spring flowers, they would be much more largely planted.

Of the extremely early bloomers the Snowdrop takes the lead, blooming at times while snow is yet on the ground and always showing its pure white flowers before other plant life has begun to show the effect of approaching spring. They may be planted any time from early October until the ground freezes to prevent planting. They present a beautiful effect on the lawn where a number of the bulbs have been planted in a cluster. They should be set from one and a half to two inches in depth and give satisfactory results, either scattered throughout the lawn, or in clusters, and may be left for years undisturbed and will give the most satisfactory results.

The crocus with its various hues and colors, blooms at about the same time as the Snowdrop, and requires about the same culture. For naturalizing in grasses, they prove to be most satisfactory. In planting simply dig them into the soil two or three inches in depth and about the same distance apart. If planted in good soil they will increase in quantity of bloom produced for years and prove to be an ever increasing source of pleasure.

Coming to the tulip, no other flowering bulb is better or more favorably known, and none of easier culture. Being so easily grown and producing such a profusion of brilliant and varied colors, aside from coming so early in the spring, they are most deservedly popular. They will grow where anything in the line of hardy bulbs can be produced and are absolutely hardy under almost any conditions. They may be planted in beds, borders, nooks or any place that best suits the fancy of the grower, and will always yield an abundance of the most satisfactory bloom.

In planting they should be set so that the bottom of the bulb will be four or five inches below the surface of the ground—and about the same distance apart, or perhaps a little further. Tulip bulbs may be left in the ground for a number of years with good results, but it is more satisfactory to take them up at least every two years, during June and re-set in the fall, as you will get larger and better bloom, with greater uniformity.

Hyacinths are equally satisfactory as the tulip, but not so generally planted for out-door flowers, because they are not so well known in a general way. The culture is very similar to the tulip, but should be planted some deeper, as the bulb is larger.

Neither should they be planted so closely together.

The Narcissus or Daffodil is one of the widely cultivated and most genuinely esteemed. Their extreme hardiness makes them one of the most popular. Cover from three to six inches according to size of bulb and set four to eight inches apart. They thrive in almost all kinds of soil, under trees or among the grass and are fine for naturalizing. They are the most satisfactory of all bulbs for this purpose. When once well established they will last for years and each succeeding year the clumps will multiply in size and strength until the beautiful blooms can be gathered in endless quantities. They can be had in both single and double varieties. I might mention Iris, both Japanese and German that are always

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favorites. Scilla Siberia, which are valuable for permanent edging and Lily-of-the-Valley, which is one of the most dainty of all. It is best to plant clumps, which can be done best in the fall, but may be set out in spring with good results. The Lily-of-the-Valley does best in a shaded location.

THE PRESIDENT: You have heard the reading of the paper. Are there any remarks?

THE SECRETARY: Have you experienced any difficulty in the Narcissus blasting in the spring during hot weather?

MR. GUTHRIE: Yes, sir; I have noticed that several times and I have no suggestion to make as to the remedy.

THE SECRETARY: We believe it is brought about by the extreme high temperature. Am in doubt as to the remedy, except to plant in cool places and keep the soil moist.

MR. BOMBERGER: I would like to ask Mr. Guthrie as to the Ornatus, and Mrs. Wilson, and a number of new varieties, if it is safe to plant them out of doors?

MR. GUTHRIE: Some of the new varieties are not hardy. The Ornatus varieties are not.

MR. RICH: How late can we plant the Tulip, Narcissus and Hyacinth bulbs?

MR. GUTHRIE: I think they can be planted until the ground is frozen, although planted earlier they do better. I have known them planted when the ground was frozen and give quite satisfactory results, but they do not bloom quite so early.

MR. GRAHAM: In regard to late planting, I planted some last March and they did very nicely.

A MEMBER: Do Hyacinths do well for several years?

MR. GUTHRIE: My experience is, they are not nearly as satisfactory as the Narcissus; they will not all bloom the second year. Tulips will come nearer making more successful blooming the second and third year than the Hyacinths.

MR. BOMBERGER: I desire to ask further about the value of the late section of tulips. We have found considerable use for them on Decoration Day. Most of us find it extremely hard to get enough flowers Decoration Day. We have this year made quite a considerable planting of the late tulips, mostly Gesneriana, and we have planted them in shady places from the south and west side. I have some years held them until Decoration Day, which, of course, we could not have done last spring at all.

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MR. GUTHRIE: I have had very little experience with the extreme late ones.

MR. BOMBERGER: The Scarlet and Picotee are very productive and bring as much as the carnation with us. We planted them a little deep, around six or seven inches.

MR. GUTHRIE: I think that will retard the time of blooming to some extent.

MR. BOMBERGER: I would like to ask further about what would be the proper time to cut outdoor tulips to store them?

MR. GUTHRIE: I have had no experience with them.

MR. PAGE: We cut them before they get into bloom, and in order to hold them the longest put a piece of tissue paper over the flower, twisted around the stem, the same as we do with Paeonies. The trouble with the tulips, they open out too full and flat.

Speaking about tulips, hyacinths and narcissus as to continuous blooming, the narcissus and tulips are both annual bulbs; that is, they reproduce themselves every year, so that there is no reason why they couldn't produce flowers every year. But they have a tendency of setting the bulbs deeper in the ground; therefore they do not produce as well, and every two or three years, anyway every third year they should be dug up and replanted in the fall.

The hyacinths, on the other hand, is more of a perennial, and it takes two years to make a bloom. Sometimes the hyacinths will produce blooms outdoors the second or third year, but they won't stand forcing in the house more than a year. We have kept bulbs for our late trade until it was too late to plant them out doors. Sometimes, by putting those bulbs in boxes of soils moderately dry and then put them out doors, and when thoroughly frozen, cover them up and keep them frozen, and in the spring we plant them out, instead of in the fall. While they do not produce a great many flowers, still it is a great deal better than throwing the bulbs away.

A MEMBER: I would like to inquire whether you separate the small bulbs in taking up the bulb beds.

MR. PAGE: There are some varieties of tulips that never make large bulbs; even the choicer varieties have small bulbs. Again, our climate is not adapted to producing first class bulbs—the outside skin splits and they are more apt to be affected with disease. I think it is usually better to throw them away after one year. The new bulbs cost so little and they are grown so cheaply, and just as soon as the tulips are through flowering, we set out geraniums in

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the same bed, and then when they are through blooming, in order to avoid the leaves falling on the ground, we take a knife and cut them below the crown which often has the effect of making new roots. We often put in pansy beds in the fall shortly after the planting of the bulbs, and when the tulips are through blooming, the pansies are just beginning, and in that way we get a very good combination.

MR. BOMBERGER: I would like to ask a question of the roots of the lily bulbs out doors. The lily is a lovely flower. Now, it is not satisfactory to plant the lily bulbs in the spring. Would there be any advantage in potting them in the fall, and then mulching them and getting a growth in the pot and selling them to the planter in the pot and let them plant them? I have not had the best reports of lily bulbs from our customers; they do not do so well planted in the spring.

MR. PAGE: I do not believe it would do any good to pot them. Of course, we get our very best lily bulbs from Japan before the ground freezes.

MR. BOMBERGER: The trouble is they do not plant them in the fall. We have been trying to get bulbs to them in the spring in condition to grow.

MR. PAGE: I do not know of any way to get at it satisfactorily, because the roots break off easily, unless they are left in the dirt. I am inclined to think the best plan would be to keep them as nearly dormant as possible. We try to keep them in cold storage, in a temperature to about 40 degrees.

MR. BOMBERGER: Couldn't they be stuck in a pot?

MR. PAGE: I think so. There are some bulbs grow here to good advantage. The Tigrinum, Tenufoliums, Canadensis, do well here. We keep them over fairly well for spring planting and we have had good success with those bulbs.

THE PRESIDENT: The next paper is entitled, "Care of Bulbs for Room Decoration," by William Trillow, Des Moines.

MR. TRILLOW: Mr. President, Ladies and Gentlemen: I realize I was to write a paper, and on the evening I had set apart for this work somebody died and there was a telephone call for flowers, and of course I did not get to write the paper. I am going to do the best I can without one.

The subject given me is "Winter Bulbs for House Purposes." Nearly every person likes to have some plants and flowers in their rooms in the winter. The people in the City of Des Moines who burn gas, either for

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cooking purpses or light, cannot very well have flowers. However, a few flowering plants can be had, if they can keep them in rooms where there isn't too much heat or where it is not too dry, and not very much gas. The people in the country can do a great deal better than those in the cities, because they do not have to contend with these elements.

I will mention a few things that are best suited, giving a brief account of their treatment. Perhaps there is no plant more enjoyed in the house than the Easter Lily. Everybody likes to have an Easter Lily. The Longiflorum kind, commonly known as Gigantum, can be bought in almost any seed store during the months of September and October. Also another variety, the Formosa. If you will put this bulb in a five-inch pot, with a little broken flower pot or some coarse material in the bottom, for drainage with a good soil composition, and placing your bulb the right way up, cover it over with soil and give it a good watering, put into a dark place where it is not too dry. In order to preserve dampness, you might cover it with some sacks and wet them occasionally, looking to see that the soil is moist, and in the course of two or three weeks the roots will begin to grow and a little shoot will begin to show up at the top of the soil two or three inches long; then bring it out in the light. From now on is the critical period, looking after the water. It must not stand in the saucer of water all the time; that will destroy the soil and finally the roots, but must be kept in just about the right condition. It should have water sometimes every day, or perhaps every two or three days, according to conditions. Soon the little leaves will begin to expand, and if you continue this kind of treatment, towards Easter you will likely be rewarded with a fine lily, with several blossoms on it.

What applies to the Easter Lily will apply to many others. The Roman Hyacinth, you can plant in a pan or pot. You can get the bulbs for probably 60 cents to $1.00 a dozen and put two or three or more in a flower pot; they are pure white in color? These white ones are very sweet. You can give them plenty of water all the time. They do not need to be put in the dark. You can just pot them and keep them in the light from the very beginning. They will blossom by Christmas. So their treatment is easy.

The Narcissus, paper white, is treated in the same way. They can be brought into flowering by Thanksgiving. These bulbs when planted the latter part of August or first of September, keeping them moist and covered with a little straw, and when brought into the greenhouse they come right in bloom. The same thing applies to house culture. They can stand plenty of water, but must not stand in water. The flower is white and very sweet.

Then we have the Dutch Hyacinths. Next to the Easter Lily there is no flower more appreciated than the double and single Hyacinth. You can put them into soil and keep them very wet. They can be grown in another way. There is a glass that fits the bulb; set the bulb in and fill the glass full of water and keep it full. The roots will soon commence to grow and fill the entire glass. I have seen them succeed

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splendidly. The water should not quite touch the bulb. As I said before, their treatment is much the same as the Easter Lily. You can bring them in bloom about Easter time.

MR. RICH: How do you retain the bulb in that position?

MR. TRILLOW: The neck of the glass is of such shape it catches the bulb; they run out wide to the bottom and up to a small neck.

MR. BUSSEY: How would it do to fill the bottom of the glass with a small stone?

MR. TRILLOW: You can do that if you wish; it will perhaps add to the beauty of the general outline. The roots in themselves are very pretty.

MR. BUSSEY: The bulb will squeeze in the glass.

MR. TRILLOW: The bulb cannot help but stay in its position. I expect Mr. Page has some of the glasses in his store.

Tulips we have two classes, early and late. They also are treated practically the same way as the Hyacinths, except as some growers say, tulips in order to succeed ought to be well frozen. In that way you put them in pots and set out of doors, cover with straw, have it perfectly wet then let them freeze. Then about Christmas time you bring them in and put into a moderately cool room, so that they do not thaw out too quickly. The freezing however, is not necessary. I find we succeed in getting them into flower very well without being frozen. They must be kept cool while making their roots, because they fill up the box or pot full of those roots first and after that they are ready to make their growth. The bulb of the tulip is a flower in embryo. The soil composition does not necessarily have to be of the finest at all. That applies to all of the Dutch bulbs.

As I have said, we have the late and early tulips. Early in February you want such varieties as the La Reine and Yellow Prince, and then later on the Kaiser Kroon and Murillo. The Murillo is possibly the best tulip we have. They can be kept out of doors until about the 1st of March, then take them into the house and they will commence to grow at once and should be in bloom in about two weeks.

Next come the double and single Daffodils. They also can be grown in the house readily, but they must not be started too early; they must be thoroughly rooted before they are brought into the house. They must not stand in the water continually. Nothing should stand in water, except the hyacinths and Chinese lilies, which

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as before stated will grow in water. They are easily grown and very beautiful. The Crocus can be grown in the same way. Take a dozen of bulbs or so and put them in a pan and keep them dark for a few weeks until they have rooted well, and then start them into growth and they will soon come into flower. The Lily of the Valley can be grown in the house. Many people will be surprised to know that you can take a dormant Lily of the Valley crown, as big as the end of your little finger, put them in wet sand, and if they are in a warm enough place, you can get them into flower in three weeks, that is, if it is warm and moist enough.

The last item I shall mention is the Spiraea. There are various varieties. One of the handsomest perhaps is the Gladstone. They come into this country from Holland about October. Plant in a pot or box; keep them moist and in a dark place, while they show signs of growth at which time put in a light window. Along about Easter or early April you can expect to have a lot of white fluffy flowers.

All these things can be bought in the seed stores during the months of September and October for a very small amount of money. Fifty cents spent one year will possibly induce you to spend a dollar the next. While I have mentioned these things for indoors, you should not forget to use them outdoors. I do not know of anything handsomer in the spring than a bed of tulips.

I must say that as a rule it is better to get new bulbs every season than to try to bother with the old ones, for they deteriorate in this country. The ground usually gets too dry before they are matured. In Holland where they are grown they have a moist soil.

MR. RICH: What can you do with a matted Lily of the Valley bed, grown for years?

MR. TRILLOW: I would dig up the whole thing, cut it up in chunks and replant them 8 or 10 inches apart. I don't think it will interfere with their blooming, as you have interfered with but a few crowns; the center ones are not damaged at all.

MR. RICH: Where they are separated will they bloom better?

MR. TRILLOW: Yes, more freely and give better flowers than in a matted condition.

MR. BOMBERGER: I would like to know if there is any fertilizer you can give bulbs; will they stand any kind of fertilizer?

MR. TRILLOW: I would say, I don't think there is anything necessary. You might get the best barnyard article for fertilizing. All

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bulbs of that nature are flowers in embryo. The flower is there; all you have to do is to have something to sustain the bulb until it produces the flower, such as ordinary garden soil kept in a moist condition.

A MEMBER: I would like to ask if it will do to take Lilies of the Valley that are matted and bring them into the house?

MR. TRILLOW: Yes, you can take a spade and cut out a clump and bring into the house. In many cases the Lily of the Valley coming from Europe are often frozen and it doesn't hurt them a bit, apparently.

MR. KREBS: I would like to inquire if you consider it practical for school house grounds, where you want flowers of varied kinds in the same bed, in order that the children could see the different kind of bloom, to have paeonies, hardy phlox and other perennials that would bloom at different seasons of the year, thus affording bloom, if possible, from early spring until late in the fall?

MR. TRILLOW: The subject is foreign to the subject we are discussing.

THE PRESIDENT: That question will be answered in the next paper I think.

THE SECRETARY: Could you give us the treatment of the Amaryllis? It is grown in the house and a great many people fail in it.

MR. TRILLOW: I know but very little of the Amaryllis. It is a plant that does not strictly come under the management of a practical retail florist. There are some amateurs who know ten times more about the Amaryllis than the florists would known about them.

THE PRESIDENT: We will pass to the next subject, "Herbaceous Borders," by J. T. D. Fullmer, Des Moines.

HERBACEOUS BORDERS.

J. T. D. FULMER, DES MOINES.

There are several things to take into account in considering this subject. First, as to the location we have at hand. Second, the length of border to be planted.

If the location is a good south exposure and we have a fence or wall to the north, the plants used may be of a more uniform size of growth, than when we are called upon to furnish a background and border in one.

The planting is best done in the spring in this section of the country as the roots are better established before they are put to the test of stand-

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ing our Iowa winters. The plants should be set thick enough that the ground will be well covered where all are fully developed. Care being taken to plant the taller kinds at the back, yet do not aim to have the back line all of the same height.

If the border is short as on a private lot, then only a few of the choicest kinds need be used, such as paeonias, funkias, helianthus, platycodon, lobelia, phloxes, delphiniums and gaillardias, so arranged that the size and color will harmonize, but if one has a good long strip to plant as in a park or some commercial florists place then we can enlarge our scope and take a more general collection of both sizes and colors. This then should include poppies, hollyhock, anemone japonica, aquilegia, iris in variety, rudbeckia, yuccas, goldenrod and wild asters and last but not least some annuals, such as phlox drummondi, scabiosa, petunias, salpiglossis, balsams and marigold.

I am aware my list of plants looks small but if all the hardy herbaceous plants were divided into three groups based on their popularity, the first group would include only ten or twelve kinds, the second thirty to fifty and the third would be much too numerous to list in detail.

Ellwanger and Barry, J. Woodward Manning and the Shady Hill Nursery Co., all agree that the six most popular hardy herbaceous perennials in America are, anemone, hollyhock, larkspur, iris, peony and phlox.

W. C. Egan of Highland Park, Ill, says, a bed composed of the following twelve kinds will produce flowers from early spring to late fall, phlox subulata, lily-of-the-valley, bleeding heart, iris, (German and Japanese), platyeodon, phlox (tall), rudbeckia, (golden glow), gaillardia, boltonia, (latisquama), and sunflower, hence we find a continuation of flowers may number comparatively a small number of kinds, the main thought should be to so arrange the plants as to have good effect, remembering that "any plant is a prize in the border if it fits, and any plant is a weed if it is inharmonious."

MR. GRAHAM: I would like to ask if the Japanese Anemones are entirely hardy here?

MR. FULMER: They have been with me, very hardy. Of course, I believe in covering all herbaceous plants in the winter.

MR. WRAGG: The gentleman to the left, who spoke about the Paeonia as a desirable plant for the school yard, I couldn't think of anything better. It is certainly one of our most gorgeous plants we have, and will stand extremely hard usage. I know some that are 40 years old, and I know of nothing better to add to the beauty of the school yard. Many varieties of the German Iris are also perfectly hardy. If you have them once planted and that is all you have to do. I woudn't put out the Japanese Iris, because they must have attention and care. In this latitude I wouldn't be afraid to stick in around the edge of the school ground two or three Yuccas;

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they are nice. There are many of these herbaceous hardy plants that ought to be planted out more on our school grounds, not only to give arborial effect and beauty, but to set off the grounds and make them more attractive.

MR. BLACK: With us the Anemone is not hardy; it might be with enough protection. I tried it a number of times and had no success with it.

In regard to something for the school ground, I can think of nothing that would be ahead of the peony. We have clumps on our place that have been tramped over for many years. I know one lady, after they would bloom, would cut the whole top off and they would come back the next year and bloom, but not so well.

As to the Yuccas, I do not know; I have just had partial success with those. Our greatest trouble comes in the winter time. As you know, the leaves are evergreen and they have a tendency to spread out with the weight of the snow, and finally there will only be a small center left. I think if you will take twine and tie the blades up together, that will protect the center.

MR. WRAGG: I want to call Mr. Black's attention to the Anemone I had in mind, the Rananculus, are hardy here. This common one we have here; it is beautiful if planted in a border and it will do well.

MR. BLACK: I did not have reference to the native varieties. I had reference to some I got from John Lewis Childs.

MR. KREBS: I was very much interested in what the gentleman to the right said. I didn't know anything about practical experience, only in a general way; I am not in the business at all, commercially. About four or five years ago I planted a mixed bed on my own lawn. I dug it out about two feet deep, put compost in the bottom with good soil. As one of the gentlemen expressed it, I didn't only sprinkle, but in the dry time flooded it. I got excellent results, having beautiful paeonies early in the season and phlox later on. By the way, I planted bulbs, the varieties that have been talked of here, Crocus and the other varieties, and in that way had a continuous bloom from early in the spring until frost. My reason for asking the question was to know whether others had more extensive experience. I am a member of the school board and I suggested the planting of flowers and vines along the school fences, and then Hollyhocks and some other taller varieties in the border. This border of Mr. Fulmer's appealed to me. They had appropriated $250 for me to spend, and I wondered whether my

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method was warranted by experience. In this bed I prepared I used Paeonies, Phlox, Columbines, Gaillardias, Pinks, some six or seven varieties.

MR. TRILLOW: While the gentlemen have been talking about this I have thought of a list of varieties which I think practical experience would warrant for the gentlemen who are talking about school grounds. They are, Paeonies, German Iris, Golden Glow. I noticed one thing, Mr. Wragg mentioned the Yucca. I would raise a question about the Yucca; it is a sharp pointed plant, and the boys and girls on the school ground are apt to be boisterous, and a child might get right on the point of one of these Yuccas and put an eyeball out. Lemon Lily, Orange Lily, Columbines, Delphiniums, Dielytra spectabilis, variagated Funkas, Japanese Anemone, Hardy Asters, Phlox, and a little Phlox subulata, always in bloom early in the spring. Of course, in conjunction with that, do not forget the bulbs, because they are in blossom during the school period, and they can all be planted among herbaceous stuff.

MR. WRAGG: I do not know what kind of a Yucca the gentleman is talkng about. I have been talking about the Yucca filamentosa. There are a lot of them grown in Texas, but the Filamentosa has no needles or spikes.

MR. BOMBERGER: I believe I will go a little further on school ground plants. I believe some of the plants ought to be brought from the homes of the patrons, which would encourage them to take more interest. Of course someone has to oversee it.

A MEMBER: I would like to suggest that a school ground ought to be kept looking well all the year around. I do not wonder the children do not want to go back to school; there are any quantity of places that look better than the barren, dead looking school ground. The scholars would take hold and do something if they had a little start.

GROWING FLOWER SEEDS.

BY CHAS. N. PAGE, DES MOINES.

I have always been fond of flowers and in our old home garden in Ohio, we had flowers in great variety. When we moved to Nebraska, our home was noted in the neighborhood for the beautiful vines which bedecked the porches and arbor, and the many flowering plants in the yard. Soon after coming to Des Moines in 1876, I became an employee in the seed store, which is now known as the Iowa Seed company, and then my active interest in floriculture in a commercial way began.

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While there were many flower seeds used then, still by far the larger part were exchanged between neighbors and friends, instead of purhcasing from seed companies. Experience has proven, however, that much better seeds could be obtained from those who made a specialty of growing flower seeds, and the cost was so little that it did not pay the private grower to try to save his own seeds. The business has increased rapidly, until now it is a surprise to the uninitiated to know of the immense quantities of flower seed used in this country.

In California, where the climate is especially favorable to the crop, many hundreds of acres are devoted to the growing of Sweet Peas alone, and car loads of seed Sweet Peas are shipped to the wholesale and retail seed merchants, not only throughout this country, but to Europe and other foreign lands.

Most kinds of flower seeds, however, are grown in Europe, particularly in Germany and France. I was much impressed with the wonderful acreage in flowers when I first visited the great seed growing establishments at Erfurt and Quedlinburg, Germany. These are out-of-the-way places, not in the line of the general travel of American tourists. In going South from Berlin, around on the southwestern side of the Hartz Mountains is located the village of Erfurt, where practically every foot of land is devoted to growing flower seeds. The landscape is a panorama of beauty. There are about 30 prominent seed dealers located at this small town, and they all have large acreages in the various kinds of seeds. Fields of 10 to 50 acres of pansies are not uncommon, and still larger acreages of asters, phlox drummondi, ten weeks stocks, and other beautiful flowers, and in the fields where mignonette and some of the other very fragrant flowers are cultivated, the air is laden with perfume.

Quedlinburg is some distance north and west, but the land there is also devoted very largely to the growing of flower seeds, and the landscape looks like an immense vari-colored carpet. One grower there, whose place I visited, cultivates over 10,000 acres in seed crops, and while he grows some garden seeds and sugar beet seed, still a very large share of his land was in the various kinds of flower seeds, and aside from the field grown crops, much space is devoted to the finer sorts which are grown only in pots. One item alone consisted of 25,000 6-inch pots, each one containing a good sized plant of the German Ten Weeks Stocks. These flowers were all hand fertilized, by using a camel's hair brush and taking the pollen from one flower with which to hybridize another. These plants were all arranged on shelves or benches, outdoors, with a shade over them, arranged like the seats in an amphitheater, and required hand watering, and special care every day. This is only one item, they also grew immense quantities of wall flowers, primulas, petunias, cinerarias, and other plants in a similar way for hand hybridizing beside the immense quantities grown under the usual outdoor culture. They had large green houses for growing gloxinia, calceolaria cineraria and other seeds which require hothouse temperature, although by far the larger number of plants were grown in cold frames or on outdoor benches; as may well be supposed, it required a large number of persons to cultivate this sized place, and at

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that time, there were over 3,000 laborers in the field, using more than 700 horses and oxen in cultivating the crops. Several other seed growers at Quedlinburg cultivate from 100 to 3,000 acres.

It requires an immense amount of labor to grow flower seeds, far more than is ordinarily considered, as many of the flower seeds, such as Pansies require hand picking every day and great numbers of women are employed in this branch of the work. I spent considerable time on one 3,000, acre farm, where they grew about 3,500 kinds of flower seeds, and of course, in handling such a great number of varieties it requires constant care to keep the various sorts pure and true to name, to rogue out any which are not up to grade and to see that they are kept properly labeled. The men and women who are largely employed in this class of work, have devoted their time to it from childhood. They are careful, particular, and still can be employed at very low wages. The usual wage for men is equal to about forty to fifty cents per day in our American money; for women thirty cents per day and for children ten to twenty cents per day. It will thus be readily seen why it is that flower seeds are more largely cultivated in Europe than in this country. Our only hope to compete with them is on the class of labor which can be done with the help of machinery, as ordinary laborers in this country are not only more careless, but it is necessary to pay several times as much for work.

Aside from the Erfurt and Quedlinburg districts, there are large amounts of flower seeds grown in Northern Holland around Enkhuizen. Pansies, Nasturtiums, and some other varieties of flower seeds are grown in quantity in some parts of England; in Southern France there is also a great acreage in flowers, especially around Olliuolles. Here flowers are cultivated not only for their seeds but in the manufacture of perfume, and also for cut flowers, there being a daily express train devoted entirely to the shipment of cut flowers from this section to Paris.

The business of growing Flower Seeds in this country, has grown greatly during the past ten years. The climate of California, is especially adapted to the culture of many sorts, and aside from sweet peas previously mentioned, there are large quantities of verbena, aster, zinnia, cosmos, nasturtiums and other sorts grown there. During the past few years, asters are becoming very popular throughout the country, and great quantities of aster seed are grown in certain parts of Michigan, and near Rochester, New York.

For nearly 25 years past, we have devoted considerable space to the growing of certain extra choice strains of flower seeds, on our own place near Des Moines, and some very choice varieties have developed on our own grounds. While sometimes these are the results of careful painstaking hybridization, still we must admit, that most of the new varities are from sports or chance hybridizations produced in the natural way. Sometimes they are the result of a continuous high state of cultivation, kept up year after year, which causes them to break and produce improved strains. This has especially been true in growing Sweet Peas, and the so-called Spencer varieties of Giant Sweet Peas, originated this way.

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The writer has visited the noted Burbank place in California, and from talking with him and with other California growers, is inclined to think that practically all of the varieties said to have been produced there came from chance sports, but it required the eye of an expert, such as Mr. Burbank or his employees to discover any improved sort in a large field. I have no doubt but that nature produces hundreds of such variations of type each year in the private gardens of the people, which are over-looked and lost because they do not come to the notice of any one whose eyes have been trained to look for the unusual or who would readily discern any such variations of type. It will readily be seen that success in growing flower seeds as well as in any other avocation depends on skill, painstaking labor, and a trained mind.

THE PRESIDENT: There is a little matter of business before us. I think Mr. Page has a resolution he wants to offer.

MR. PAGE: It may not be known to all of you, but I think it is a fact that Iowa is the only state in the Union where there is a law restricting the sale of insecticides, so that only druggists can handle it. There isn't a drug store in Des Moines that handles it. I mean, that handles anything but Paris Green. I had a little experience. I wanted only a few pounds of arsenate of lead. I went to four different drug stores; two of them didn't even know what it was, the other two had heard of it but never handled it. It is something which is sold in car-load lots in other places. One of our men in East Des Moines went to a druggist over here and wanted 2 pounds of it, and they didn't have it, and he told them to order it from the wholesale house, and the wholesale house wanted to know what they wanted such a large quantity for.

I tell you gentlemen it is a serious situation. It has cost the fruit growers and farmers and gardeners millions of dollars during the past 25 years. If any one wants an insecticide, he is obliged to send to St. Louis or Chicago, Kansas City or Minneapolis, some outside town to get it. I have prepared a resolution and I would like to see some action taken on it, which is as follows:

In view of the widespread injury to shade trees, fruit trees, and all kinds of crops by insects which have increased to an alarming extent during recent years, and the impossibility of securing a supply of insecticides and fungicides, without sending to dealers in other states:

Be it Resolved, that the Iowa Horticultural Society and the Society of Iowa Florists in convention assembled do hereby request and urge the state legislature to enact such legislation as may be necessary to permit the sale of insecticides and fungicides by seedsmen, florists, agricultural implement dealers and other merchants.

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Upon motion duly made the resolution was adopted.

THE SECRETARY: The following resolution has been handed to me and I will read it:

Whereas, We believe in the great commonwealth of Iowa.

We believe in the power of her manhood and in the glory of her womanhood and in the future of her boys and girls.

We believe in the unequaled fertility of Iowa's soil and in its ability to suport millions of other farmers in addition to those who have already been enriched by its products.

We believe in the inexhaustable supply of Iowa's coal as a potential creator of power for manufacturers.

We believe in the immense value of the Iowa market for manufactured products of every description.

We believe in the opportunities which Iowa offers to young men in every walk of life and that an equal investment of money or of effort or of intelligence will bring greater returns in the state of Iowa than in any other place on earth.

We believe in the value of publicity as an aid to development.

Therefore, Be it Resolved by the Florist's Association of Iowa in annual convention assembled that the state of Iowa should establish and maintain a bureau of investigation and publicity which shall investigate in detail the resources of the state and the accomplishment of its citizens, and shall spread that knowledge into every corner of the earth, but particularly among the people of our own state.

MR. BOMBERGER: It seems to me if we pass resolutions here, there should be some channel through which these matters should be pressed upon the legislature.

I therefore move you that a committee of three consisting of Mr. Page, Mr. Trillow, Wesley Greene, act as a legislative committee to bring these matters properly before the legislature.

The motion was duly seconded and carried.

WEDNESDAY EVENING SESSION.

THE PRESIDENT: The first subject on our evening program is "Grapes," by Miss Minnie Avery, Council Bluffs.

GRAPES.

MISS MINNIE AVERY, COUNCIL BLUFFS.

This subject suggested itself to me as one that might be of interest for we hear many papers and discussions about the apple, and almost nothing about the grape.

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The history of the grape is almost as old as that of man. We read of extensive vineyards being planted long before any other fruit is mentioned. Perhaps they had their origin in the Garden of Eden. We read in the Bible of the vine in the early history of Noah. It is also mentioned by Virgil and other ancient authors.

Again, they are spoken of in the Bible when Moses sent out the spies to find the land of Canaan. It was in the time of the first ripe grapes, and the Bible says that they "cut down from thence a branch with one cluster of grapes, and they bare it between two upon a staff." This certainly shows how luxuriant the grapes must have been even in the early days.

The mythological fable of the march of Baccus relates to the extension of the culture of the grape from Asia into Europe. In Italy so much of the land was occupied by vineyards that the Emperor Domitian, fearing a scarcity of grain, issued an edict, A. D. 81, forbidding the extension of vineyards and compelling the planting of grains. This edict remained in force long afterwards, through fear that an abundance of fine wine might tempt the barbarians of the North to invade the country.

Grape seeds were found in the ancient Egyptian tombs with the mummies, and also among the remains of the Swiss and Italian lake dwellers of the Bronze Period.

In Virgil's time the varieties under cultivation seem to have been very numerous, and the varied methods of training and culture today are identical with those described by the old Roman writers.

The modern grape has been so improved over the wine varieties of the old world that it has become a very popular dessert fruit. With so many varieties, and the aid of cold storage they may be had for a long period of time each year.

They are one of the most wholesome fruits, and there are even sanitariums in which the "grape cure" is systematically carried on. How much more pleasant it must be to have a diet of grapes than to fill one's system with drugs.

Unfermented grape juice is becoming a very valuable and popular product, and the raisin grape is of great commercial value. It is said the raisin grapes were brought to California by the Spanish monks who were engaged in missionary work among the Indians. They thought the mild climate of California was similar to that of the land they had left, and they found that the grapes grew well in their new surroundings.

In planting grapes there are so many varieties that one must study and select those best adapted to his own location.

With us the Concord is the old standard, but the Worden and Moore's Early do well. I think the Worden is a little more subject to mildew than the Concord, and must be marketed as soon as ripe.

I have grown the Niagara, Brighton, Oneida, Jefferson, Vergennes and Lady Washington, and found them excellent varieties, but they are not hardy and must be protected in the winter. Agawam, Empire State and Eaton did not prove satisfactory.

The soil should be dry, well worked, and enriched. The grape grower should always bear in mind that it is an essential point to secure a per-

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fectly open, sunny exposure. In our locality no atmosphere can be too warm or bright for the grape. The vine will make a vigorous growth in the shade, but the crop will be uncertain and the fruit of poor quality. The vines will be likely to fall a prey to mildew.

Grape vines must be kept within moderate bounds and trained to an upright trellis. It is difficult to give any exact rules for pruning, as no two vines are alike and it requires judgment and skill to so prune as to give the best results. An old vine can be renewed by cutting away the old wood and training up a new set of upright shoots, which will soon produce as abundantly as the old vine.

There are now so many fungus diseases that take our grapes that we will have to study and carry out a systematic spraying if we hope for a crop. Two years ago the crop was almost a failure on account of a new fungus disease. The last season was practically a drouth in our locality, and no fungus disease appeared among the grapes. Some of my neighbors who were troubled with fungus a year ago tried the experiment of spraying this year. But of course on account of the character of the season the results were not apparent, as the disease did not appear even in the vineyards which had not been sprayed. The sprays used were lime-sulphur of different strengths, 1 to 50, 1 to 75, and 1 to 100, and in every instance it burned the foliage. This might not have happened if there had been rains to wash the vines. The Bordeaux mirture was also tried, and that did not burn the foliage. Whether the vines will be benefitted another year by this year's spraying remains to be seen.

THE PRESIDENT: The next subject is entitled "Song of the Willows," by Eugene Secor, Forest City.

SONG OF THE WILLOWS.

EUGENE SECOR, FOREST CITY.

Willows, willows, oh my willows,
All the greens and all the yellows,
All the cousins, all the brothers,
Pussy willows and the others;
Stand up in a row before me,
Wave your graceful banners o'er me
While I weave you into rhyme.
Come my willows, it is time
Some one sang a song for you,
Song of love and friendship true.
Ye are found in many lands,
Northern valleys, southern strands,
Dwarfs and giants all akin;
Phoenix-like ye all begin
Life again when cruel fate

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Strikes ye down with the ax of hate.
Will the time once more return
When, like children, we shall learn
Of strength and lightness in thy wood
That in other days made good?
Oxen bent their necks to thee
In the days that used to be,
And I'm told that ladders, too.
Made of willow, tested true.
Posts and lumber quickly given,
Honey too thou bring'st from heaven.

(PUSSY WILLOW.)

Come my charming pussy willows,
Shake again your fluffy pillows
In the lap of tardy spring;
Let me hear once more the wing
Of the Priestess Honey Bee
As she earns her marriage fee—
Claiming gold for every rite
Whispered ere she takes her flight.
Ye are first of all the cousins
To unfurl your flags by dozens.
Brave and hardy as an oak,
Every flower-bud wears a cloak.
March winds do not frighten ye,
Mad and spiteful though they be.
Welcome, pussy-willow friends,
First to bloom when winter ends,
We shall hear the blue birds sing
When ye tell them it is spring.

(SALIX ALBA.)

Salix Alba, stand thou forth!
Common tree of all the north,
Known by every farmer's son
Where the careless blizzards run.
Thou art of the useful sort,
Hast not had much chance for art,
Yet if men would give thee room,
And not write thy certain doom
In a pent-up lot with swine,
Thou'dst assume a form divine—
Splendid in thy massive strength—
May we greet thee thus at length!
May we see thee in thy beauty
When released from slavish duty!

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(SALIX, LAURIFOLIA.)

Brother with the laurel leaf,
Tho my tribute may be brief,
Come and let me once caress thee,
Come and let me once more bless thee;
Thou didst come from over seas
But thou camest here to please,
And we thank the kindly hand
That assisted thee to land.
Glossy leaves of laurel-green,
Fresh and cheery, always clean,
Thou hast come we trust to stay,
And we welcome thee today.
Thou shalt have a favor'd spot
In my homestead garden plot
To remind me that a friend
Holds his color to the end.

(GOLDEN WILLOW.)

There's another standing near
Crowned with golden-coated cheer—
Stored with sunshine like a smile.
Tropic warmth didst thou erstwhile
Quaff for many a summer time
In some genial foreign clime?
Thou hast brought thy dower of gold
To a climate where the cold
Blights exotics by the score,
But thou keepest hope in store.
Thou remind'st me of one
Who, with locks kist by the sun,
Brighten'd many an hour for me
'Neath thy sunny canopy.
Thou comfortest in subtle ways—
Golden dreams of golden days.
O thou wealth-endower'd brother,
Thou dost shelter like a mother!
Tho a tramp from o'er the sea,
Thou makest glad the heart of me.

(SALIX BABYLONICA.)

Standing in the row before me,
Waving pendent branches o'er me
One there is—a sorrowing one—
Comes from silent Babylon—
Weeping mayhap for the glory
Once her boasting, now a story.
Art thou thinking, O my brother
Of the river where that other

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Song was hushed because the harpers
Hated Zion's proud usurpers?
Art thou longing, yearning, weeping
For thy native land, now sleeping
'Neath the years who certain fate is
Flowing like thy loved Euphrates?
Ancient people now are low,
Reaping fruits their sires did sow;
Wasted were their primal stores,
Timber, virgin soil, and ores;
Now, where kings once sat in state
Conies play about the gate.
Grant O, Heaven, that my dear land
Harking back, may understand!
Weep, O pitying Babylon tree,
If the truth we fail to see!

(OSIER.)

Who comes here with supple grace
Asking for herself a place?
'Tis Miss Osier, charming maid
Playing with her pliant braid.
She it is who travels far,
Visits peasants, meets the Czar,
Welcome every place she goes
From the Poles to Barbadoes.
See her dainty wicker-ware,
Couch and basket, cab and chair
Which in open hand she brings,
Gifts to cotters and to kings.
Peasant women smile at her,
Th' grandee is her flatterer.
Thus Miss Osier, small and lithe,
By her manners, winsome, blithe,
Teaches always—as she should—
Size is not the only good.

(SALIX NAPOLEONIS.)

Here is one whose kinsmen wept
O'er the tomb where Napoleon slept.
Not for him they bent in grief
On that isle whose storm-beat reef
Is the emblem of his life—
Marred by mad, unholy strife;
Widows' moans and orphans' cries
Caused their sorrow, I surmise.
Silver tears fell too, I ween,
O'er the crime of Josephine—
O what grief did she endure

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That a crown might rest secure!
(When ambition baits the hook,
Sorrow writes her memory book.)
Welcome brother to this shore
Wars of conquest here are o'er,
Every man is born a king,
And true worth awaits the crowning.

(SALIX NIGRA.)

Where the prairie rivers flow,
Winding slowly as they go
Thro' the sedgy marshes, or
Bounding like a conqueror
Thro' the once objecting hills,
Past the busy, noisy mills,
There's thy home my hardy friend,
Guarding shore and river bend.
When the wasting fires ran wild,
Then the river saved its child.
Thus the Pale Face found thee growing
Where the wicked flames, pursuing,
Could not utterly destroy—
Means kind nature doth employ
Lest the earth be stark and bare,
Treeless, cheerless everywhere.
Thus my dark-named brother, thou
Heard'st the Redman's wierd pow pow;
Kept the secret of the tribe
Sacred, like a loyal scribe;
Furnished poles for anxious squaw
When she would her luggage draw
On the march behind her pony
Over fields of agrimony;
And perhaps a wigwam frame
Thou did'st lend the dusky dame;
Anyhow there's no denying
Thou did'st hear the wild geese crying
Overhead when southward flying;
Witness'd deer and antelope
Feeding on the distant slope;
Help'd the beaver build his dam,
Saw him as he proudly swam
Over lakes his toil had made,
Happy as if he had play'd
When thou camest, trusty friend,
We may never comprehend,
But so long has been thy span
Since God planted thee for man
Thou hast earned the title proud—

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American—without a cloud.
O my willows ye are many,
And I will not pass by any;
Songs, however, must have ends
Even tho we sing of friends.
Goodby, willows, till the Muse
Prompts some lines men will peruse.

THE PRESIDENT: The next subject is taken from tomorrow's program and is entitled "The Persian Walnut east of the Rocky Mountains, Shall We Grow it in Iowa?" by Dr. A. B. Dennis, Cedar Rapids.

THE PERSIAN WALNUT, SHOULD WE GROW IT IN IOWA?

DR. A. B. DENNIS, CEDAR RAPIDS.

The so-called English Walnut is really like the peach, a native of Persia, and from there introduced into Greece and Rome, and from Rome throughout Europe. It was imported into England in 1562, and from there into the United States, fully one hundred years ago, hence the name, English Walnut. It has come to be an immense food production of southern California, over two hundred acres in a single crop, and these vast crops of nuts, are picked by a machine that will pick, hull, clean and sack twenty acres a day, with an expense of but $3.00, not including the wages of the two men it takes to operate this labor-saving machine, that does the work of 100 pickers.

The past year we have tried to find out all we could of this nut-bearing tree, especially in the eastern states, and we have been led to believe that in the near future, this valuable nut will lead to more extensive planting in many states west of the Rocky Mountains in an experimental way, if not in a commercial; we also believe wherever the peach finds a suitable climate, this nut tree may adapt itself, providing the soil and elevation are to its liking. So far, most of this experimenting with this supposed capricious and tender nut tree, has been done in Pennsylvania, New York, New Jersey, and Maryland. We have found trees in full bearing from ten years to one hundred years old, and these old trees show no signs of decline, but on the contrary, give good crops annually from ten to one hundred dollars per tree; such behavior of this nut tree in a climate as severe as north west Pennsylvania and Lockport, N. Y., ought to induce Iowa plant breeders at least, to look up these hardy seedlings, and make an effort to breed a hardy variety of this nut for south Iowa, if it is possible to do so, and I believe it can be done, but of course, I cannot prove it, from the fact, I have not experimented with it. I, however, have studied the climatic conditions of its old home in Persia and find it is not a paradise for tender fruits and

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nuts. Dr. Thorne, a German naturalist, in describing the Persian says: "Snow falls occasionally in every part of Persia and may justly be called an extreme climate, especially in the North. We are sure it is this trying climate, that gave the peach that wide adaptability in the United States; for the peach is grown from Canada to old Mexico, and it may be, that this walnut, a native, from that same trying climate, has more or less of this wide adaptability in the United States, and this is really what we find, for it is grown in Texas and as far north as Massachusetts. Like the peach there is a vast difference in hardiness of the wood and fruit buds of the Persian walnut, the same as in the peach, so if we ever succeed in growing it in any part of Iowa, we must recognize this very important fact, and instead of planting tender varieties from southern California we must get our breeding stock from these hardy old seedlings from New York and Pennsylvania and also from France, and graft on to our native Black Walnut; this stock not only adds one-fourth more of hardiness, but enlarges the boundary of a wider adaptability, both in climate and soil, for our native walnut thrives in wide realms in all the temperate latitudes of the United States; so by the use of this stock we shall not alone get greater hardiness and wider range of soils, to grow this capricious nut, but at the same time ripen up its wood and fruit buds earlier in the fall, from the fact, the native root will do this for the Persian top of the tree, by ceasing to send up the sap, and in this way prepare the fruit buds to stand a much lower temperature than trees on their own roots, and yet some of these old trees are on their own roots, and stood from fifty to one hundred winters with their cold blasts harmlessly beating against their branches and trunks.

Our southern Iowa growing seasons are about as long as those in northern Persia, and this is very important, for if a fruit or nut wood has sufficient growing season to ripen up their wood, and fruit buds they will endure much harder freezing than if improperly matured. The behavior of these supposed tender nut trees in New York, and Pennsylvania in standing that climate for fifty to one hundred years and yet in full fruitage, and no signs of decline, should entitle them to be classed in a less tender species than we have so far given them credit for, don't you think? These facts rather indicate that this tree is far from semitropical nature, but seems to attain its best development and long life and fruitage, in a cool temperate climate, for it is a fact in the Gulf States, it is not a good bearer unless it is planted in the cooler and more elevated sections.

Since I have no experimental facts of my own to present, I shall quote a few statements from letters of the growers of this nut in the eastern states with whom I have corresponded, and obtained sample nuts, grown in the east; in one case specimens from a one hundred year old tree, one of the largest and finest nuts in my collection. I have taken pains and expense to secure these samples and information as to the behavior of this Persian nut bearing tree east of the Rocky Mountains, to impress the members of this society, especially the plant breeders of Iowa, with nut culture in general. Possibly we can add one more fruit for the future inhabitants of our state, that will, before the close of this century,

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struggle like caterpillars in a tree, in getting their food supply from Iowa soil. In the discovery of these hardy seedlings of the eastern states fruiting for a hundred years in a climate almost as severe as ours, seems to me, should appeal to plant breeders of Iowa. Dr. Robt. T. Morris of New York City, who has the largest collection of nut bearing trees on his farm at Stanford, Conn., of any man in this country, writes me,—"The Persian walnut does well as far north as Boston, Mass., and southern Ontario, but this refers to individual types, and we shall have to find the types *for different* localities through experimental cultivation, for instance, one variety which is perfectly hardy at Lockport, N. Y., is not at all hardy in the vicinity of New York City very much farther south. It is my opinion, if you graft a number of Persian walnuts on to black walnut in Iowa, that some of them will do perfectly well." Mr. L. C. Hall of Erie county, Pa., who has a tree on his farm fifty years old, says, "This tree came from Germany, was brought over as a yearling by an early settler, it is now fifty years old and does remarkably well, has a spread of over fifty feet, last year had 5 1-2 bushels of nuts, produced fourteen crops in succession and one year it had eight bushels, nuts hang in clusters from two to four nuts in a cluster, tree never winter kills. I am sure it will stand your climate, for it gets like the North pole here." In the Pennsylvania State Horticultural Report for 1909, the committee on exhibits of fruits, state, "The English walnuts exhibited by L. C. Hall of Avonia, Pa., were the largest and finest ever exhibited in the state, these nuts received the highest award at this meeting." A. E. Pomroy, of Lockport, N. Y., says: "Besides the original tree planted by my father in 1876, and has borne $100 worth of nuts in one crop, there are many young trees on the farm, also a new grove of eight acres set some years ago. This variety is very hardy, some winters here being so severe as to freeze and kill peach trees and grape vines, but the Pomroy Persian walnut goes through all of our winters uninjured." J. G. Rush, of West Willow, Pa., the originator of the Rush Seedling that at ten years from the seed bore two bushels of nuts, writes about a seedling one hundred years old, he says: "This month I found a tree at the foothills of Mt. Nebo, in Lancaster county, this tree is about one hundred years old, was planted by an Iron moulder from England, it closely resembles the delicious French variety Franquette, but this tree is an early vegetating kind, and for that reason cannot belong to the Franquette type. I expect to plant and propagate largely from this old seedling. Judging from the great size and spread of the tree it must be one hundred years old, and is still in perfect vigor, and a regular prolific bearer." J. A. Jones of Louisiana, formerly lived near Kansas City, Missouri, writes me and says: "W. G. Fry of Mountain Grove, Mo., grafted Persian walnut on to black walnut that stood 32 degrees below zero without injury."

Perhaps I have given enough facts from experimenters to convince us that the so-called English walnut is far from a semi-tropical nature, but should be classed as to hardiness with the peach and a cool dry climate and location for best results.

In closing I again urge nut culture; too long this interesting branch of horticulture has been neglected for over twenty years, I have tried to

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awaken an interest in nut culture, especially in our native hickory and chestnut and collected samples from many sections and I believe as to the scale of points as applied to nut value, none excel in fine quality our native hickory in Iowa. As far as I am able to judge from samples sent me from other states nature came nearer producing the ideal hickory nut in Iowa than in any place I know of, and it seems to me if we appreciate these native nuts as we should, the Iowa nut can be made as valuable in the markets as the pecan or English walnut. The hickory in New York sells today from $3 to $8 per bushel at wholesale. Because I have in this paper called your attention to the very good behavior of the Persian walnut in the severe climate of other states, does not mean for us to abandon the hickory as Iowa's ideal nut, for extensive planting and cultivating, for nature has planted this nut of ideal quality upon our soil and given us varieties by her natural selection that even in its wild state, is superior to any nut I know of, especially is this true as to keeping quality and this is of the greatest commercial value. Dr. Morris says, "Some hickory nuts will keep three years better than other varieties will three months." And while I have not tested any after three years, but have some over one year old, that are as sweet as though just picked. This cannot be said of any other nut. It remains for us to test the Persian walnut, but it is our duty to look for the ideal hickory nut and when found, to plant them commercially by the thousands.

Each year the demand for good nuts increases far beyond the supply and there is no good reason why Iowa should not furnish her share of nut food. I marvel when I reflect, how nature has toiled for the thousands of years by planting the banks of all Iowa streams with native plums and nut bearing trees, that beautify the land with charming bloom, waving banners of green, restful shade, lucious fruit and nuts, bountiful moisture, and a modified climate. It becomes us not to destroy, but rather to carry on, and perfect this beautiful work of nature, the giver of all life, the leader of all progress, the inspirer of all happiness, and the beautifier of all art.

THE PRESIDENT: The next subject is entitled, "Report on the Work of the Conservation Commission," by Prof. Thomas H. Macbride, Iowa City. In the absence of Prof. Macbride, the paper will be read by Prof. Shimek.

THE WORK OF THE IOWA DRAINAGE, WATERWAYS, AND CONSERVATION COMMISSION.

THOMAS H. MACBRIDE, IOWA CITY.

It will be noted that by title the Commission in question has a very wide field for investigation and recommendation. In fact the present statute is a response to a demand upon the legislature, a demand ap-

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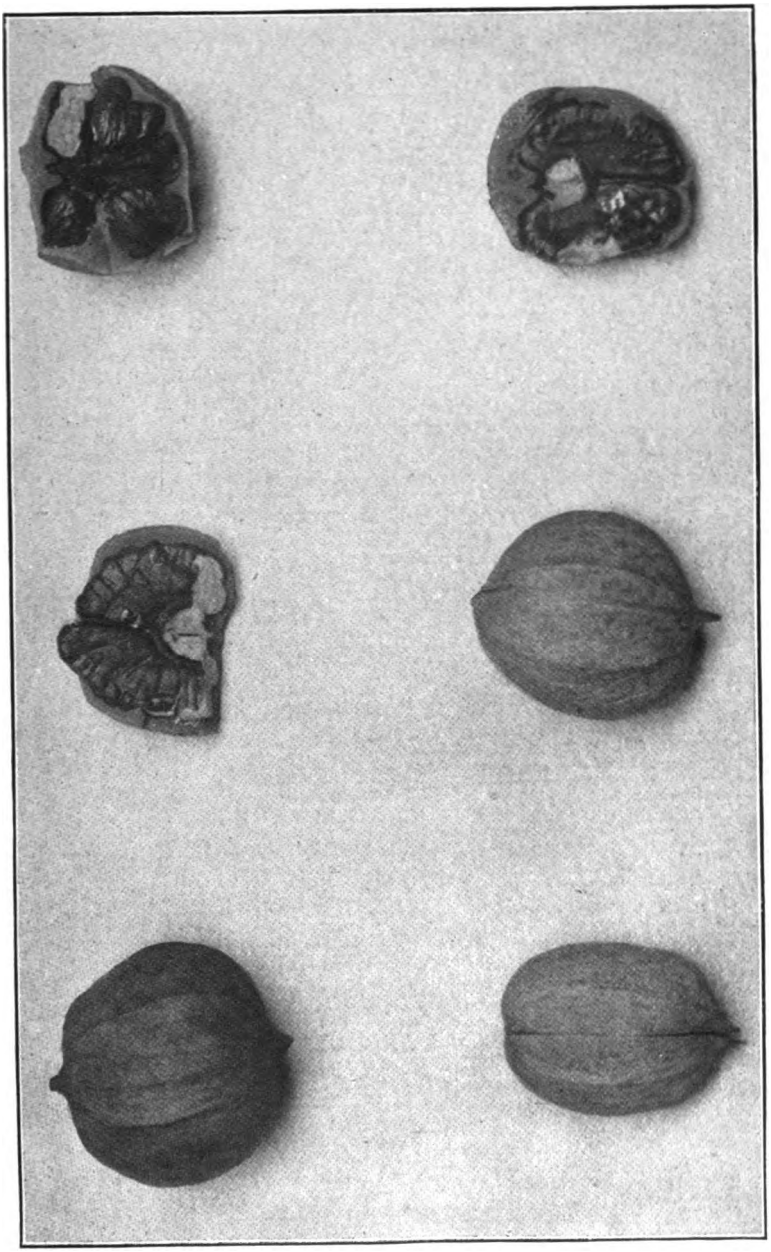

NATIVE HICKORY NUTS
Showing size and thickness of shell.

—Photograph from C. G. Patten.

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proaching along two lines. On the one hand many men were thoroughly convinced that the waterways of the State were in condition far from satisfactory. Not only was the energy of our streams unused, but only were the streams a perpetual menace by their constant overflows, but in many places, even as principal channels for drainage purposes, they were utterly insufficient and unserviceable. Great streams like the Des Moines, not only offered no service as a common carrier, not energy, for practical uses, but actually brought annual destruction to town and farm throughout its length from one corner of the State to the other. Besides in its upper reaches this stream is so crooked that drainage water of whatever origin escapes only in tardiest fashion. The case of every other stream in Iowa is similar, differing in degree only, differing only in the relative amount of lost service and relative extent of damage annually inflicted. That was one set of facts calling for attention. On the other hand there was a second. Many men were convinced that the resources of the State of every sort were suffering waste and stirred by the National conservation movement, these men under the guidance of the Conservation Commission named by Governor Cummins were urging legislation along general lines that should lead to the investigation of all natural resources, not the water only but the soils, the minerals, the lakes, the forests and even the wild fauna so fast disappearing from the face of Iowa.

In response then to this double demand the last legislature by statute authorized the Governor to appoint a new commission to be known as the Drainage Waterways and Conservation Commission. This omnibus title was abundantly justified by the instructions to the commission, found in the law as passed. The curious may consult the statute book. Governor Carroll in due time appointed the commission and for two years it has been attempting with very limited appropriation the accomplishment of unlimited things.

Fortunate for us the general government was already moving along the general lines of drainage study. Under direction of the Secretary of War, surveys were attempted on the Des Moines river from the Capitol to Keokuk and under the Department of Agriculture similar work was inaugurated on the west fork of the same stream from Humboldt to the Minnesota line. The purpose of the first survey was to secure data relative to the value of the lower Des Moines for navigation and power; of second to attain if possible a plan for making the upper river more serviceable as a drainage channel, in carrying off storm and tile waters and less destructive in devastating farms and towns in time of overflowing floods.

The commission itself, through its secretary, an accomplished young engineer, undertook the study of the Boone river in reference to possible use of one of the minor streams for power purposes and made a survey of the stream from Webster City to the Des Moines. So much in brief for the work of the commission in the matter of waterways and drainage.

In the study of more general conservation the commission instructed certain of its members to prepare arguments relative to the several topics conservation of soils, conservation of waters and streams, conservation

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of woodlands and the report of the commission now in the hands of the printer will contain a presentation of each of these matters with recommendations as to best means at hand for securing to our people the most fortunate and efficient use of all the natural resources of the state.

The work of the present commission is finished. This work will be of value not alone in the large amount of valuable data and the unexpected but, I believe, accurate information which cover the pages of the printed report, but still move in that the idea of conservation has thus in Iowa taken concrete form in that the attention of all our people, both within the state and beyond its boundaries has been called to the fact that we *have resources* and resources of value, all unused, largely unstudied of indefinite possibilities, certain in the future under the guidance of intelligent people, to add greatly to the wealth, prosperity and health of the fairest commonwealth on the face of the globe.

CONSERVATION.

PROF. B. SHIMEK, IOWA CITY.

Prefatory to presenting the stereoptican illustrations Prof. Shimek said:

The question of Conservation is so broad, it seems almost absurd to attempt to cover it in the course of a few minutes. It has been a question of wide interest, because of the manifold phases which it presents. It appeals to every man, no matter what his interest; it calls for his attention and holds it because there is something in some phase of it that concerns every citizen of the country. We have in this country unbounded natural resources. Our fathers came to a land that teemed with plenty; everywhere they found untold riches, and all they had to do was to garner them for their own use. They found these resources and made use of them, we fear today, not always wisely. The pioneer was forced to do much that today seems extravagant; he was placed in a position where he had to use that which was within his reach. My father used cedar for posts and walnut for rails, because he had no other materials, and many other things which were the only available necessities in the days of our forefathers have become luxuries. We were not wise in the treatment of our resources when we emerged from that early pioneer state. We were not wise because we seemed to think those resources boundless and inexhaustible, and one by one they have passed out of our reach. These resources were of many kinds, and many may not concern this organization, excepting as its members are interested as citizens of our country. There were the resources of the mines, which were at first wastefully used. More recently the dump heaps of the mines have been worked over and boundless riches have been derived from them. The animal resources that everywhere abounded, the bison, the beaver, the lowly clam, were supposed to abound beyond the possibility of extermination. Yet one by one they have gone. In my boyhood, if a farmer did not have big buffalo lap robes to protect him and his family when he drove to town, he was not properly providing for the comfort

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of himself and family. But the bison is only a reminiscence. The beaver has also practically disappeared from the greater part of our country, and the clam is rapidly growing less abundant. And so we had a great many changes of this kind. But we have treated perhaps no one of our natural resources more extravagantly than our lands. You will say, many Iowa homes were made possible because of the munificence of our government. Formerly settlers actually came to the land, and used it. But look at those who in more recent years have indulged in government lottery, taking up claims merely for speculation. How is it that thousands upon thousands of acres of land, which we are sometimes told is intended for the real settler, has been thrown into the hands of speculators? We have given away our lands, and the speculator fattens upon them. But we have done more. We have taken the coal and other mines and practically given them to men who now use them as means to endanger the welfare and the very existence of our citizens. In this way the people have been placed at the mercy of a few men who practically control the supply of fuel in this country. Think of the absurdity of putting this power into the hands of selfish men to grind down and oppress those who were the givers. We have done the same thing with the water power of the nation, for in large part we have given it to those who abuse it, and take advantage of us. All that we do is just to sit back quietly and wish we had our finger in that pie! Out yonder in the far west, when they catch a man in an effort to defraud the government, his neighbors will say, oh, yes; it is too bad; he shouldn't have done such a thing, but then you must not be too hard on him, because everybody else does exactly the same thing.

This organization is however chiefly interested in that great and grand natural resource, the forest. We have treated the forest in various ways and looked upon it from various standpoints, for it has been valuable in many ways. But this resource, like the others, has been abused, and I will now endeavor to show you in a measure what has been going on in this direction.

(Here the stereoptican demonstration began, which can not be reproduced here, but was very much enjoyed by an appreciative audience.)

THURSDAY FORENOON SESSION.

THE PRESIDENT: The society will come to order.
We will now hear the reports from committees.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

We, your committee on President's address beg leave to submit the following report:

We realize the importance of the President's plea for young blood and hope that some method may be suggested that will be the means of interesting young men in the work of the Society.

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We approve the suggestion of a ladies' auxiliary society and in order that it may speedily be realized we recommend that the premium list for next year be arranged to include premiums on canned fruits, jellies, preserves, etc. Such entries being open only to ladies in attendance at the meeting. We also recommend that each member be strongly urged to bring wife and daughters to the next meeting in order to insure the presence of a sufficient number to justify an organization.

We recommend some immediate action on the part of the society to liquidate the debt against the publication "Iowa Horticulture" in accordance with the recommendation of the President.

We are in hearty accord with the recommendation that methods of propagation of plants be demonstrated in connection with the meetings of the Society as has been so successfully done in other states. We believe that it might also be well to add the demonstration of packing methods in successful operation.

We believe that the bulletins of the Society should be enlarged and their publication continued as recommended.

W. B. CHAPMAN,
FRANK C. PELLETT,
C. G. BLODGETT,
Committee.

REPORT OF COMMITTEE ON SECRETARY'S REPORT.

The committee to whom was referred the report of Secretary Greene begs leave to report that it has gone over the financial statement of the secretary, checking his vouchers with the receipts and find it correct in every particular.

Respecting the secretary's recommendation that more power be given to city park boards over the planting of trees in street parkings in the hope that better varieties of trees might be more common along our streets, we beg to say that the committee is in hearty sympathy with the suggestion and recommends that the legislative committee of this society be requested to use its influence with the General Assembly toward an enactment enlarging the powers of park commissioners so that such park boards may more fully control and direct the beautifying of towns and cities.

Regarding the suggestion that a larger appropriation be asked from the coming General Assembly we recommend that this matter be taken up by the governing board of this society and that such action be taken as may seem necessary and wise.

Also in the matter of bulletins to which the secretary calls attention, your committee is impressed with the need of such publications from time to time, and if the funds are available the committee recommends that a larger use be made of such means of disseminating horticultural information among the people, and the hope of this committee is that funds will be provided for that purpose.

EUGENE SECOR,
JOHN FORSTER,
MILLARD HARRINGTON,
Committee.

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REPORT OF COMMITTEE ON TREASURER'S REPORT.

We, your committee on the Treasurer's report beg leave to say that we have examined the vouchers and cash on hand and find the same to correspond with the treasurer's report.

P. F. KINNE,
W. C. HAVILAND,
T. C. TANNER,
Committee.

On motion duly made these reports were adopted.

MR. PELLETT: I would like to present the Report of the Committee on Publicity, appointed at the close of the last meeting last year, which is as follows:

REPORT OF THE COMMITTEE ON PUBLICITY.

We, your committee on publicity, beg leave to report that we have given the matter considerable thought and attention during the past year. We find that Iowa is losing population a considerable portion of which is going to the widely advertised fruit districts of the west. Iowa has made her reputation on her corn and hogs and even her own people are unaware that Iowa is favorably situated for horticultural pursuits. That our state might rival those most famous in this direction is evidenced by the success of those who are following up scientific methods in the culture of fruit and vegetables. We believe that there are localities in Iowa where apples can be grown with as great a certainty of success as in the most favorable localities on the Pacific coast where orchard land values range from $500 to $3,000 per acre, if the same care and attention be given. As evidence of this fact we point to the success of a member of this society who reports a net profit of nine thousand dollars from a single crop of apples on less than forty acres. We find that blackberries have yield as high as seven hundred dollars per acre, and a three-acre patch of red raspberries whose owner claims a return of twelve hundred dollars per acre on an average for three years in succession. With onions we find a man who has averaged a return of three hundred and eighty-seven dollars per acre from a forty acre field for a period of ten years. These are only representatives of others that can be mentioned. That there are not more such reports is because so few people in our great state are engaged in this kind of pursuit.

Further, we believe that these facts should be brought to the attention not only of our own state but of other states as well to the end that Iowa's possibilities in this direction may become better known. To do so will require a systematic plan of advertising involving far more expenditure than our society can afford.

We believe that a bureau of publicity should be established under the direction of the state and if placed in proper hands will prove of the greatest value to the commonwealth.

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We recommend that the society continue the work of a committee on publicity for the present in order that as a society we may keep in touch with the present movement toward a State Bureau of Publicity and render what aid we may to its establishment and furnish such information as seems desirable to those who shall be placed in charge.

Upon motion duly made and seconded the report was adopted.

MR. PATTEN: In conversation with our president, since coming here, I learned of the illness of our Brother W. A. Burnap. He is sick, in a hospital in Minnesota. The suggestion was made by our president that the society should appoint a committee to write a letter to Col. Burnap, expressing our sympathy and regrets that he is unable to be in attendance with us. I offer a motion to that effect. (Duly seconded and carried.)

THE PRESIDENT: I might add, I received a letter from Mr. Burnap some time ago; he then said he was just able to be propped up and look at some of his mail matter. He wanted me to tell the members that no one knew how much he felt disappointed of his not being able to be here.

I appoint as that committee: C. G. Patten, C. F. Gardner and G. H. Van Houten.

We will now take up the regular program. The first subject is, "The Farmer's Strawberry Patch," by Victor Felter, Cherokee.

THE FARMER'S STRAWBERRY PATCH.

VICTOR FELTER, CHEROKEE.

The strawberry is recognized as the most popular, the most enjoyed and appreciated of any of the fresh fruits. Who is there who does not relish a dish of good strawberries or a dish of strawberry shortcake. The one who does not is a curiosity. The only one I ever knew, has now grown to be a wrinkled, homely, hopeless old maid.

While the strawberry is the prettiest and most attractive of fruits it has the disadvantage of being very perishable. It should reach the consumer as soon as possible after it has been picked. Much handling, and traveling long distances is not conducive to excellent quality. No one is worthy nor better prepared to enjoy this at its very best than the average corn belt farmer. Even the renter, if he has a two year or longer lease cannot afford to be without the strawberry patch.

No matter what our opinion may be of Iowa as a fruit state we all know that the strawberry is just as much at home here as in Missouri, Arkansas or the most favored spot we know or can imagine. I have been told by those who have traveled in certain parts of Canada that

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strawberries were so thick that the buggy wheels would roll up red, colored with strawberry juice.

The northern and north central Iowa farmer looks upon fruit growing as intended only for the specialist. And there is a good deal of truth in the remark of a neighbor who said that he can buy the fruit he uses cheaper than he can grow it. Many a farmer uses the best acre of land on the farm for the orchard. He will accept as truth the exaggerations of the traveling tree salesman and many times choose varieties, either worthless or wholly unsuited to the locality. After eight or ten years waiting he finds he has a lot of measily sour crabs, or a crop of unsaleable summer apples. If planted to corn the same acre of ground would produce twelve to fifteen dollars worth of grain which would buy quite a little fruit. The question is, would the family have the fruit if purchases were to be depended upon. Probably not. These objections, however, do not apply to the strawberry, which will produce a very profitable crop in only two years.

Any soil that will produce a good crop of corn will also grow strawberries successfully. One dollar's worth of plants will represent the cash outlay to grow enough fruit for the ordinary family. It is no trick at all to grow as many bushels of strawberries as of corn on a given piece of ground.

The local fruit grower or nurseryman can be depended upon to supply suitable varieties of plants. The farmer cannot afford to do experimenting with new varieties but should choose some of the well known standard sorts. The Dunlap comes nearest fulfilling all requirements of a general purpose variety than any I know of. Nine-tenths of those present would doubtless name it as their choice. It is a strong plant maker, which is the first essential to a full crop. It is a staminate and of splendid quality. Crescent, Bederwood, and Warfield are other standard sorts which do well for everybody. Some early variety, such as Excelsior, and a late one, as Gandy or Pride of Michigan, will extend the season and add a few quarts of berries at each end which will taste better than the best of them when they are plentiful.

To accomplish the most with the least labor, the farmers berry patch, like the garden, should be planted in rows for horse cultivation. Fewer rows of greater length would be a good change for all garden work. Where hand work is depended upon, weeds are very apt to get the better of the strawberry patch, during rush seasons like corn cultivating and hay making.

The matted row is commendable. Rows of corn planter width and plants 18 to 24 inches apart in the row will be found about right. With most varieties, enough plants will be grown if weather conditions are favorable. Rows running north and south furnish the best colored fruit.

Thoroughly prepared ground is an absolute necessity. Fall plowing will be mellow and easily prepared. Two deep discings, one harrowing and a good job of planking will be the only preparation necessary. Fresh dug plants are sure to grow if carefully planted and cared for. The roots should be wet when they are put into the ground. Perfectly straight rows will be appreciated when an attempt is made at close cultivation.

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A six-shovel, two horse cultivator and a fine tooth cultivation are the only necessary implements. Two or three hoeings will be required to keep weeds out of the row. During favorable seasons the rows will grow to 18 to 24 inches in width. Effort should be made to induce early plant growth, so that large strong plants will be produced. During the hand work the plants should be placed around so as to occupy all the space in the row.

Soon as the ground freezes in the fall so as to carry a loaded wagon, the entire patch should receive a covering of straw, or course manure or any litter that is free from weed seeds. This covering, if left until pretty late in the spring, will prevent early plant growth and reduce the danger of being caught by a late frost. In some seasons this precaution would be unnecessary, so a good plan is to uncover a fourth of the bed as early as vegetation wants to start, so that some extra early fruit may be had in case the freeze does not injure the blossoms. Enough of the covering material may be left on the rows to prevent the fruit from getting dirty during rains, while the surplus raked between the rows will aid conservation of moisture in the soil, prevent weed growth and be appreciated, as a carpet, for the pickers.

The fruit will easily find its way to the kitchen and dining room. Every member of the family quickly and willingly becomes a strawberry picker.

To be at its very best the fruit must remain on the plant until every part of the berry is perfectly red and ripe. The family will be supplied with one of the greatest luxuries of all the good things grown on the farm, for a period of three to six weeks, according to season and the varieties planted.

Soon as the last of the fruit is gathered, preparation must be begun for the crop for the next season. No farmer should be so neglectful as to fail to either renew the old bed or plant a new one each year. Weeds or timothy and bluegrass will soon smother the plants unless they receive cultivation.

The mower may be used to clip off all vegetation, and then rake all trash entirely off the ground and burn it. Danger of insect pests is thus reduced and the ground left in condition for cultivation. Some renew the bed by throwing two furrows together between the rows leaving a strip of plants eight or ten inches wide, while others simply loosen up the ground by going two or three times to the row with the shovel cultivator. Frequent cultivation all summer at intervals of a week or ten days will again encourage plant growth and thus ensure this wonderful luxury for another year.

THE PRESIDENT: The paper is now open for discussion.

MR. GARDNER: I have listened to the reading of this valuable paper, and I do not see how any one could write a better paper and cover the subject. I can see no great reason for a lengthy discussion. I didn't notice anything but what I can indorse.

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MR. BLODGETT: I have been very much pleased with the paper. I have been raising strawberries for about forty years, and I am agreed with the paper about the variety. No other one variety I believe will take the place of the Senator Dunlap. We not only have berries in the spring, but in the fall. I have been picking berries in September and October.

There is one point on which I differ a little with him, and that is the distance in the rows. The first Dunlaps I planted that way. With the ordinary cultivation we give plants, I find that the Dunlap made so many plants, that right in the row we didn't get much fruit; that became so thick that it needed some thinning or else a further distance of planting. I planted the last two or three years, four feet apart, and I have spent more time this last fall thinning those rows than I did in cultivation. So I would caution you not to get the Dunlap too thick.

MR. PELLETT: In regard to planting them far apart in the row, I think that will work pretty well. Many of us have to contend with the white grub. If we plant too far apart to start on, and the grubs have got in their work we usually do not have a very good proportionate stand. I call attention to the remark made by Mr. Reasoner last year. When he first started the Dunlap he got a lot of mole traps and caught all the moles, and then he said the white grub put him out of business, and he was willing to have the mole back again. I have been considerably interested about the mole. I find a whole lot of people call the big short tailed field mouse the mole. When you speak about a mole, that is the animal they think of, instead of the fellow with the big shovel feet that does so much digging. I am very much in doubt whether really the mole eats corn. I think it is the only effective means of ridding the ground with grubs I have seen. Last season I put strawberries on ground that was in cultivation for 30 years. I want to say to you, in that ground the grubs were mighty thick. The mole occasionally cut off a strawberry plant. The white grubs killed so many more than the moles that I will take the mole every time.

MISS AVERY: I would like to ask about the Senator Dunlap. I have raised it several years, but it was always checked with the rust so bad that it wasn't satisfactory with me.

MR. BLODGETT: I have been planting it for a great many years and I find it the freest from rust on my grounds of any plants. I have had considerable rust years ago. The Bederwood

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rusted with me so I had to abandon it. Then I planted the Warfield and Dunlap in alternate rows and the rust disappeared.

I don't like to leave this mole in the garden; I catch him every time. I know what I am speaking about when I speak of the mole. I have seen plants withering and dying when there was a mole track within six or eight inches of the strawberry plant. There is a way you can get rid of them without so much trouble. I rotate the ground planted to strawberries. As quick as the second crop is harvested I turn under the vines and plant to sweet corn. I then fall plow it and the next spring I plant potatoes and we get most of the white grub, and then in the fall plowing you have your chickens follow you and you get your ground as clean that way as it is possible. But the mole will go up and down the row and loosen it up, and this fall in the drouth there, it did lots of injury. I was always very much pleased whenever I found my trap down with a mole.

MR. HARRINGTON: I am not going to sit still, advocating keeping moles. I would be willing to give a large bounty to get rid of them. While I have seen the statement that the mole never eats seeds, I have got to be shown. We all know the bob-tailed field mouse doesn't go into the open ground; they get under cover; they won't even touch a tree if you have six or eight inches of open ground around it. I am satisfied, from my observations that moles do eat seeds, notwithstanding the fact that they eat worms and subsist largely on them. I have had to replant this spring two or three times in my plantings in the garden, of sweet corn, and I have poisoned the sweet corn and found them to disappear. I am satisfied they ate that poisoned corn. I would be very glad to offer a large premium if I could get wholly rid of them.

MR. MURPHY: I found several years ago you could get rid very easily of the grub, by scattering a certain amount of salt, which is pretty nearly as good to the plants as anything else.

THE PRESIDENT: How much do you put on?

MR. MURPHY: I usually cover the ground so that it would show like a light snow. Too much salt will kill your ground for the time being. I discovered this by using salt on Asparagus beds, when the grubs were thick. When I commenced to salt the bed, the grub disappeared. So far as the mole question is concerned, people have lots of ideas. I am satisfied that you can't get a velvet mole to eat anything but an angle worm, and I

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would like to see the man that can show me anything else the velvet mole has ever been known to eat. The bob-tailed mouse follows the mole wherever it can find them. The moles will get into a corn field and root up a row of corn, but you will never find where he takes a bite of corn. Of course he kills the corn.

MR. BLODGETT: Did you ever raise any sweet potatoes?

MR. MURPHY: Yes, sir; more than anybody in my country.

MR. VAN HOUTEN: When Mr. Murphy says moles will not eat anything but angle worms, I am ready to dissent. I have tried to put a piece of mouse in the hole, and you can see Mr. Mole come to the surface holding it. I do not know positively that he will eat it; I do know positively he will grab it. He appears to be eating it; he goes through the motion of eating. I have come to the conclusion that the velvet mole will eat worms of different kinds, and especially will eat flesh. I am ready to concur with Mr. Murphy and others that the velvet mole will probably not eat vegetables unless forced to it.

MR. PELLETT: The matter was given a pretty thorough study in the Kansas Agricultural Experiment station. I don't know how many stomachs they gathered and examined. I think the white grub was found, not only there but in some other places, to form a very large portion of the food. I think, as Mr. Van Houten says, they will eat almost anything when they are hungry. In one or two stomachs the remains of corn were found. But it has always been corn which was disintegrated, by soaking. I think it is also generally recognized, as Mr. Murphy says, that the bob-tailed field mouse actually eats seeds. There is no question but what the mole does a good deal of injury in the strawberries by moving about in the soil. If you disturb a plant just sprouting, it is very easily broken off so it will never grow.

C. O. GARRETT: I consider the mole the worst enemy to the corn breeder, because he not only destroys the corn, but actually consumes a large percentage of it. During the last two years Mr. Bishop and myself and others of my neighbors caught moles directly in the corn rows and dissected them, and found some of them just stuffed with kernels of corn that were eaten, and most of them in the germinating stage, and of course, would taste very sweet.

MR. PELLETT: Was that the blind mole?

MR. GARRETT: Yes, sir; I have quite a great many in the garden. We found that they would scarcely eat fresh corn, but when the corn was moistened or soaked for two days, they would eat it readily. So we know these moles eat corn.

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MR. DENNIS: The experience of the last speaker corresponds with what Dr. Morrison of New York says in regard to nut trees. On investigation, he attributes the destruction of about 50 per cent of the young trees to the moles. He is probably one of the best posted men in the United States. That is his experience in planting nut trees.

THE PRESIDENT: I have changed my mind about the rest of this program. I think we will not have any further discussion until we hear the next paper, which is "Strawberries for the Home." by H. P. Mason, of Kingsley.

STRAWBERRY GROWING FOR THE FARM HOME.

P. H. MASON, KINGSLEY.

Of all fruits that may be produced on our northwest Iowa farms there is no fruit that can compare with this big, red, luscious fruit, it is the earliest in the season and is a favorite. Its pleasant taste and health giving properties cause it to take rank among the best fruits we may grow on the farm, but alas, how few farmers are producers, they seem to think it is hard to raise, they do not care to try, they are so busy raising corn and hogs they can hardly take the time.

Strawberry growing has been written and talked about more than almost any other subject and I do not presume to put forward any new theory or principle in its production, but tell the old story over again what has been written and said, much of it was years' ago that gave thoughts which caused increased interest in strawberry growing and many of those who were its champions then have passed away, the new generation must hear the story again, the truths of the Bible preached fifty years ago a guide to those then living must be preached again to lead men and women into right living with the oncoming of each generation. I am a farmer and not a bookmaker or public speaker or writer but having a fondness for horticulture I have taken some time and pains with it and will suggest a few things that I trust might help my brother farmer solve the strawberry question and lead him to try to produce his own choice fresh berries for his table and not buy berries from Arkansas or Texas half ripened and boxes two-thirds filled. I do not desire to be understood that my way is the best or better than anyone else but I have had good results. Any ground well prepared as for garden will answer, if slight mixture of sand it would be well, a good coat of well rotted manure will improve; mark ground in rows about three and a half feet apart to be easy to cultivate, set plants in spring time two feet in the row, closer in autumn; clean culture is required. It may be largely done with a corn cultivator run shallow for this purpose, the rows should be as long as possible on the farm, there is no need of scrimping as must be

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on a village lot. If weeds come in the rows hoe or pull out after vines are well started and runners come, turn them to follow the rows so as to make a matted row, I think farmers will find this more satisfactory than hill culture. Later clip runners so that growth may be strengthened with plants rooted. When winter begins, after the ground is frozen, cover lightly with straw, do not use timothy or clover on account of the seed; when freezing is done in the spring, pull straw from rows into the open spaces. When berries are done mow off the tops of plants and remove or burn with the mulch, if practicable, then cultivate spaces between rows. New growth will soon start in the rows of plants and the runners may be turned in spaces for the next crop. After the new rows are well established the old plants may be removed thus you have new plants for fruiting. Two or three year plants get woody and are less vigorous. I think it better after three or four crops have been raised on the same patch to change to another, if only a little distance and change of location leaves them "out in the cold" an old saying. There are so many good varieties such as your neighbors have found reliable and doubtless plants could be obtained, grown in your vicinity, by making inquiry.

I have not found it very satisfactory purchasing of agents with distant nurseries, they always have some new world-beater-berry and as a rule it is best to steer clear of such.

Bederwood and Warfield do well here, must be planted together as blossoms are not perfect. Crescent is good and Senator Dunlap, all good here.

SOME EXPERIENCES WITH STRAWBERRIES.

HARLOW ROCKHILL, CONRAD.

After trying several experiments in hybridizing the Louis Gauthier with our common varieties of strawberries to get everbearers and failing to secure satisfactory results, I thought if some other variety fruiting out of season, could be secured and crossed with the Louis Gauthier, bringing two lines of everbearing blood into the seedlings, the chances of getting the desired results would be much increased. About this time the Pan-American came out as an everbearer. It is a bud sport from the Bismark, it was secured and in the fall of 1904 buds of both vareities were emasculated and the pistils of one variety dusted with pollen from the other, making reciprocal crosses. Seeds were sown in window boxes in February, 1905, some of the resulting plants fruited in August and September that year. These were perhaps the first plants on record of the large fruited varieties to fruit the same year the seeds were sown, about twenty-five per cent of these seedlings showed the character of fruiting out of season, some seedlings were rusty, some had rough berries with poor color and poor quality. There were many freaks among these seedlings. One sent out runners twelve to sixteen inches long which rooted and produced from three to five trusses of fruit each, most of these run-

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ners produced no plant bud. After fruiting all such runners died back to the mother plant. Another variety had running fruit stems about twelve inches long, with three separate settings of fruit. Like several others these were no good except as curiosities. Two varieties named "Francis" and "Americus" were selected out of this batch of seedlings. The plants are quite healthy, blossoms staminate quite resistant of heat, fruit medium sized and of excellent quality. They are far better plant makers than Pan-American. They are certain to fruit out of season under average weather conditions. Some of their runners have fruit buds when set out, others send up buds in from one to three weeks after taking root, others do not fruit till the next year. No doubt more good results could be obtained from further work along this line of breeding. Many seedlings of Pan-American have been grown, perhaps not over ten per cent of them showed any inclination to fruit out of season. The plants were generally small, made but few runners, with plants only four to eight inches apart on the strings, fruit soft and of poor quality. Some of these plants were bred to Pan-American. A larger per cent of the resulting plants showed fruit in autumn but no improvement in plant or quality of fruit. Many strains of the Alpine have been tried, including the Mexican, which was secured a few years ago by the Agricultural Department, none of them proved promising. The past season was very dry but our various seedlings of the Virginiana type furnished fresh berries every day from about July 20th to October 29th. The fruit came from spring set plants and their runners.

BREEDING EVERBEARING STRAWBERRIES.

CHAS. F. GARDNER, OSAGE.

My first experience in trying to grow everbearing strawberries was in the season of 1856, when I planted a packet of Bush Alpine seed in my father's garden near Portageville, N. Y. Some of the plants bore red, and some white fruit. With the good culture they received they gave fair satisfaction. Not so much was known then of what the strawberry plant could do, the great markets, afterward developed, were still unknown. As I now remember those plants the fruit was too small to pay. I brought the seed to Iowa and planted it on our farm in Howard county in 1860. As compared with the trial made in New York, the later resulted in plants that were shy bearers. They were hardy enough but the fruit was scarce and too small to give satisfaction and the plants were finally discarded. Many times since this variety has loomed up as something new; until many people, as soon as they hear the word "Everbearer" think they recognize the old Bush Alpine. Even at that early date I often wondered if there ever would be a kind developed that would be a true everbearer of size and quality to command a place on the general market.

About four years ago our attention was called to a French everbearer introduced by J. C. Vaughn, the veteran Chicago seedsman. He reported

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to us that their plants bore fine berries the first year from seed and continued bearing until cold weather. We secured of him one-hundred plants and gave them careful culture, with the idea of crossing them with our best market varieties. From this lot we have one variety, a cross of August Queen as a mother pollinated by Pearl, that is somewhat promising. The plant bore nice fruit the first year from seed, but made no runners. The second year it made seventeen runner plants, all of which bore fruit of fair size, darkish red in color, quite firm and very good in quality. The old plant when set, was divided into four sets, making twenty-one plants in all.

In the meantime we purchased over $200.00 worth of strawberry seed, mostly from foreign countries. Quite a quantity of this seed we found to be mixed with Alpine seed, the plants of which had to be weeded out and destroyed as soon as they could be distinguished from the others. This was easily done when the second set of leaves had fully developed. We also purchased plants from different parts of the country, wherever we could hear of anything that seemed hopeful to secure the desired result. Among the rest were purchased and planted on our grounds the Pan American and Autumn, productions of Hon. Samuel Cooper, Delevan, N. Y. Later we added the Francis and Americus and many other varieties.

We have crossed what we think are the most desirable kinds with the idea of producing a plant that would be a true perpetual variety of value. The result of our labor show now in what we have, besides our foreign seedlings a block of over forty-thousand plants that grew from seed that was obtained by making crosses of the very best everbearing varieties that have ever been discovered. One remarkable thing about them is, of those that have bloomed over one-half of the plants have been staminate. Many of them show bloom when the plants are only six weeks old, counting from the time they break through the ground from the seed, and bear fine fruit from August until it freezes up.

At the close of the season of 1910 we have eighty-thousand plants that were grown from this year's seed, that have been transplanted into rows. Our propagating beds are now planted with seed picked in September and later, from fruit the result of crosses of our best and strongest fruiting plants of the previous year and will not germinate until the spring of 1911. We have found that when the seed come up early in the season, many of the plants that retain the desired everbearing qualities will bloom the latter part of June and bear right along until frost. The runners also bear fruit as soon as they are old enough, and sometimes they bloom before they are well rooted. Some plants produce no runners but stool out around the parent plant; each offshoot throwing up fruit stems.

We think there are some wonderful things going on among strawberry plants by bud-variation. Prof. L. H. Bailey says: "Since no seeding is ever exactly like its parent,—there should be no greater mystery connected with the sports of buds than there is with the variation from seeds, for the causes which produce the one may be and are equally competent to produce the other." He also says: "It often happens that certain individuals of bud varieties return, on some one of their parts, to the type

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from which they came. We should observe, however, that most usually the parts which seem to return to the type, present, notwithstanding, differs from it. There has been a step in advance."

Mr. Samuel Cooper in a paper read before the Northeastern Iowa Horticultural Society at its recent session at Cedar Falls, Iowa, says: "The Pan American is undoubtedly a sport by bud-variation from the Bismark. * * * * * In the spring of 1901 my Pan Americans (1,300 in number) were all taken up and set in the field. I destroyed all that seemed to have reverted. Of those set out all fruited except four which were destroyed." He also says: "For a few years occasionally one would make runners freely and not fruit, these were destroyed and all their runners. I do not think one plant has failed to fruit for the last three years."

So it seems that the Pan American is not a seedling at all but a bud-variation of the Bismark, while the Autumn is a seedling of the Pan American. The latter has now been grown by Mr. Cooper for twelve years and has developed qualities that make it especially valuable as a base to work from to develop a new generation of plants that will in my opinion more than fill our expectations of what a good everbearer should be. Mr. Cooper is the man who deserves the most credit of anybody, he discovered the first true American Everbearer. A plant of great vitality that has the power of impressing upon its offspring valuable characteristics. He has established a valuable base to work from and a man who will work from this foundation and not give Mr. Cooper proper credit is a person to be despised by all good people. The work done by him is worth millions of dollars to the country at large. The horticulturist who does not feel interested and look into this matter is away behind the times.

There may be some in this audience who are not plant-breeders and who think the strawberry plants under discussion are connected in some way with the phenomenon of a second crop, as has been reported from many sections of the country during the past season. This has been caused, first, by the bloom being killed by frost at the usual time of blooming. Second, a long spell of very dry weather, during which the plants rest, more or less and form fruit buds to try it again. Then when the rain comes they bloom and bear fruit to a greater or less extent until frost. Under ordinary conditions the next year they revert back to the old order as though nothing had happened and the freak is ended. When we speak of Everbearers we do not consider this freak of the common strawberry plant as having any relation to the subject, whatever.

No honest man claims that any strawberry plant will grow and bear money making crops, without moisture and proper cultivation. And one that will bear right along four months or more without rest, must be well taken care of, for one to expect the best results.

The vigilant eye of the Plant-breeder must ever be on the watch for valuable sports by bud-variation and for chance seedlings that may prove valuable and destroy all rogues as soon as they are recognized.

October sixth, 1909, we found a plant growing in an Autumn row, a strong staminate, foliage dark green, very vigorous. It has made eight

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runner plants, six of which with itself were loaded with berries, ripe and green, with many blossoms. These plants were immediately taken up and set in a bed and covered with glass, where they fruited until December, when they froze up for the winter. This spring the nine plants were again taken up and set in a row by themselves. They all bore a good crop in June and then commenced to throw out runners, each of which bore fruit as soon as it was large enough, sometimes blooming before it was well rooted. The nine old plants sent up fruit stems until late in the fall and they were at all times loaded with ripe fruit so that we often picked thirty ripe berries from one plant at picking. Fruit ripened on all the runners except the small ones. The nine plants made five hundred and forty-nine runner plants, averaging sixty-one to the plant. They were a great attraction to the visitors who came to our grounds during the season from June to November. In flavor these berries are equal to a well grown Autumn, which is better than any common market berry. The blossom is large and strongly staminate. When we found this variety we could not tell for certain whether it was a seedling or a bud-variation. If it was the latter, the runner connection with an Autumn plant had been removed during cultivation. As we could find no trace of its being connected we called it a seedling.

From the forty-thousand plants mentioned, we selected five-hundred, no two being alike, all of which are from seed picked in the fall of 1909. They bloomed from six to eight weeks after the seeds came up and bore fine fruit until the first of November. The greater part of these plants were from seed of Autumn pollinated with Pan American. They are set so we can keep a record of each plant.

Persons who think they are authority on strawberries, but who persist, when you speak of the modern varieties of everbearers, in classing them with the old French kinds, or, the Bush Alpine only show their ignorance. Such persons have frequently visited us at our office and when we showed them cuts of the plants and berries and printed matter describing them, you could see at once a look of incredibility spread over their countenance, then just before they are ready to explode we take them out and show them something that is far better than anything we have told about. Then they come down to business and are not only surprised and delighted but are exceedingly interested in the work thereafter.

The class of plants we have under consideration has come down to us in such a way that we cannot go far back among their ancestors with any certainty. So many crosses have been made in a natural way that it is impossible to trace them. Generally speaking they are of the same type of the best Garden Strawberries, except that they bear fruit at the regular fruiting time and from then on until it freezes up. They seem to be the hardiest of the strawberry family and the bloom will stand a much more severe frost without injury.

There are many people who prefer strawberries to any other fruit and when they can get them from June to November and plenty of them we have no fear with regard to a market.

It may be asked by those who hear strong words of praise in favor of some of the existing varieties, why not stop right here and plant out what

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we have got and be contented and make no further efforts to improve? The answer is, there is a chance to improve. Some of the kinds already developed are poor plant makers. Some are off on quality. On some the runners will not bloom and bear fruit until it is too late in the season for them to get ripe. Some not at all until they are a year old. Some cannot stand dry weather and others cannot endure too much rain. It is not quite time yet to sit down and fold the hands and say there is no need of further effort to improve. The fact is the door to better things is always open.

We began our experiments with a view to produce a strawberry plant that will bear a full crop of fruit in June and continue bearing good sized berries of high quality until it comes cold weather. The kind is already found, if our variety of which we have five-hundred and forty-nine plants, holds up the record in the future it has made in the past. We have named it Perpetual Motion. It will have to go through an extended trial on our grounds before it is placed on the market. Each plant must be watched for rogues and the type permanently fixed by continued selection before it is offered to the public.

We do but little hand pollination, we prefer the natural way in breeding the strawberry.

THE PRESIDENT: I would like to know about the stability of the plant. Suppose you set out one of those plants, will the runners be just like the parent?

MR. GARDNER: That question is answered by my paper. It says the plant will have to be watched carefully in order to fix the type.

MR. FORSTER: Are we to understand they are self-fertilizers?

MR. GARDNER: They are strong staminates.

I might just as well say a few more words. We have with us today a man from Minnesota who has charge of their state farm of experimental growing of plants and trees, and in conversation with him, I find that he has had the very same experience I have had. I would like, if it is agreeable, to give him an opportunity to say a few words along this line.

MR. HARALSON (Minnesota): I will say, I have been working the last few years practically the same as Mr. Gardner. The only difference is, I have been using the Senator Dunlap as one of the parent plants, also a wild strawberry from Alaska. The wild strawberry has a dark-green foliage and is a very good plant maker. Those plants planted, say 4x4 in the spring, will practically cover the whole ground. We know the Pan American and also the Autumn are very poor plant makers; they practically keep on fruiting all summer and do not have time to make any plants. My idea for using these strong plant makers, was to get something that would

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EVERBEARING STRAWBERRY—PERPETUAL MOTION—ON C. F. GARDNER'S PLACE. PHOTOGRAPH TAKEN OCTOBER 27th, 1910.

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make more plants and still be ever-bearing. I have had good results in that respect. I had some seedlings of the Senator Dunlap crossed with the Pan American. The seed was planted early in the spring and the plants set out about June, the latter part, and I think it was in August until it froze up, they were bearing fruit all the time; that is, the seedlings of the Senator Dunlap. I wouldn't find probably more than five per cent that would be ever-bearing, the rest of them would be something on the Senator Dunlap order. The same thing I can say of the Alaska; it is very hardy.

As I say, I have just begun the experiment, but I am going to keep on and hope to get something very good out of it.

MR. PATTEN: I do not desire to add anything in reference to the cultivation of these new berries, but I want to congratulate Mr. Gardner on the results of the long effort that he has been making to improve this valuable fruit. It illustrates the fact we should keep in mind, that in order to reach results that are really valuable, it takes a long series of years. When we come to deal with the larger fruits in this breeding problem we should not be in too great a haste and feel that we must see results, but have to wait in patience.

MR. BUSSEY: Some one has said that God might have made a better berry than the strawberry. I think it is a favorite with nine-tenths of the people who grow berries on the farm. I am one of those. Our strawberry bed is a bed we take a great deal of pride in and have good results from. They are grown so easily and last so long and are so much comfort and profit.

THE PRESIDENT: We will now listen to a left-over paper from last evening, on the subject of "The Fine Art of Preserving," by Mrs. Ida E. Pellett. Mrs. Pellett was unable to come, so the paper will be read by Mr. Pellett, and is now entitled "Preserving Odds and Ends."

(Paper will appear later.)

MR. VAN HOUTEN: I would like to add a word on the canning proposition, and it has been tried in various places of the country, that is, by cooking longer and sealing before you begin cooking, and after it is done cooking set it away. Corn and vegetables and anything else can be cooked that way. You seal the cans, put them in a wash boiler and cook from four to six hours, and they will keep as long as you want them.

THE PRESIDENT: In glass cans?

MR. VAN HOUTEN: In glass cans.

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THE PRESIDENT: We have a paper entitled "An Apple Seed," by C. D. Black, Independence.

AN APPLE SEED.

G. D. BLACK, INDEPENDENCE.

If the title of an address should be "A Man" you would not expect the speaker to say much about the coat that covered his back or the bones, flesh and other constituents that composed his body.

You would expect to hear of his life and character that had been inherited and received from others. You would expect to hear of his characteristics of mind and disposition, that could act upon the lives of others and would continue to influence the coming generations. It is in this respect that I wish to consider an apple seed, not by making a chemical analysis of its material parts.

The Creator has not revealed to us the mystery of the invisible thing called life, but by the manifestations of the characters in a life which we call heredity, we are enabled to dimly read the history of its ancestors. In the life of each apple seed are numerous forces in carrying degrees of potential ability, that it has inherited from past generations.

These powers are shown in the straight body of Peerless and the crooked growth of Patten's Greening. In the hardiness of Patten's Greening to withstand the Manitoba blizzards and the tenderness of Jonathan, which is not able to stand upon its own legs in Northern Iowa, in the horizontal limbs of Longfield and the upright Whitney, in the slender growth of Tetofsky, in the large healthy leaf of Yellow Transparent and the sickly leaf of Wallbridge, in the early bearing Bismark and the late resistant Peerless and the Red Warrior which blights to death by its side, in the immunity of Northern Sky to wooly aphis and crown gall, in size of fruit of the large Wolf River and the small Allen's Choice, in the ability of Rome Beauty and Malinda to withstand severe freezing while on the trees, in the eating of Delicious and the unsavory taste of Haas, in the sweetness of Sugarloaf and the acidity of Scott's Winter, in the bright color of Brilliant and the dull color of Black Annette, in the emerald Greenings and the golden Fall Orange, in the leathery covered Russets in the stripes, streaks and splashes of color and patches of russet on many varieties, in the dots of many color forms and sizes on the fruit, and on the bark of the trees, in the white flesh of Fameuse and the yellow flesh of Arthur, in the color, hardness and texture of the wood, in the many different forms of the fruit and its parts, and in the size, form and color of the seeds themselves.

Those who have made careful research and study of the apple have found so many different characteristics that in describing varieties they have been obliged to form many classes. Dr. Robert Hogg, a noted English pomologist divides the different varieties into 1,536 classes and subdivis-

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ions. Dr. Ed. Lucas of Germany makes 1,620 separate groups. These inherited characters were originated as the results of certain conditions and surroundings in former generations. There is cause for each one of them, none of them came by chance. I have gone thus into detail, that we may more fully realize that the most important elements in a seed can not be seen until developed by growth, and then we can only see the manifestations of these realities. We have seen valuable qualities show themselves in annual varieties of flowers and vegetables which were dropped and lost in the next generation.

With our manner of propagating the apple it is hard for us to comprehend the possibilities embraced in one apple seed. All the Wealthy apple trees in existence are the product of one seed planted by Peter Gideon, who denied himself the necessities of life that he might obtain apple seeds to plant.

An author has thought of heredity in man as a stage coach in which he is riding with all his ancestors as fellow passengers. Others have pictured it as a trees with its numerous branches. Nothing conveys the life and characteristics of the apple to my mind more clearly than a mighty stream of water and its tributaries. The Mississippi River receives through its streams that flow into it, nearly all substances that exist in the greater portion of the United States. The chemist will find traces of gold and silver from the Rocky Mountains, iron and coal from Pennsylvania and disease germs that have come through the drainage canal from Chicago. He will not only find foreign matter in the water but also where it has been deposited on its bed and along its banks. You may take thousands of samples of water from various places in this river and its tributaries and have them analyzed and the chemist will tell you that no two of them are exactly alike. Each sample will differ in composition and proportion of its elements. A sample taken from the headwaters of the Mississippi will be comparatively pure. As we go down the stream its impurities increase. We may consider each apple seed as a sample taken from this great pomalogical river that I have in mind, we can analyze this sample by planting it and letting the invisible elements show themselves in tree and fruit. Some of the characters may lie dormant during several generations and then assert themselves, under favorable conditions. We are familiar with this principal in animal life and the same is true in the vegetable kingdom.

The Junction of the Missouri river with the Mississippi river is like the crossing of two varieties that are the products of many previous crosses, in that it brings together in one variety many elements both good and bad, some of which were not common to both. In this process the character common to both parents may be intensified and become dominant, while some of the weaker ones of each may be dropped.

Man has helped to broaden this stream by bringing together the different varieties and permitting them to cross fertilize each other.

When I retired at night I was thinking of the analogy of the life in the apple to a river in many different ways. It is not strange that I dreamed of a river and its banks lined with fishermen, among whom I recognized the faces of Mr. Patten, Prof. Beach and others. It seemed

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that instead of catching chubs and suckers, they were pulling out of the water, apples of different sizes and colors. Some of the fishermen after long and difficult search had found the best places and when they were fortunate enough to land a large red and yellow specimen, the others would gather around to congratulate and admire. Then many would try to cast their lines where the fine catch had been made. The breeder's task is to make such combinations that the good qualities may be enhanced and the bad tendencies eliminated. As an illustration of the dominance of character, there is a tree in my test rows known as Hybrid Wild Crab. The tree is a typical native crab-apple tree in leaf, color of bark and manner of growth. The fruit is also a fair sized native crab-apple, with its characteristic fragrance and taste, but is about half covered with red. I have so much doubted its hybrid origin thinking that its color might be a freak of nature, that I expect to plant a quantity of its seeds next spring and see what the next generation will bring forth. Last June I picked up fruit from under the tree that was still sound and in good condition. If we could combine the hardiness of tree and long keeping of this crab-apple with the size, quality and color of Wealthy and at the same time drop out their faults we would have an ideal apple for the upper Mississippi valley, but we could not expect that the tendency to blight in both would be diminished in their offspring.

In the distant future when the breeding stations of the country have compiled accurate records of their works, man will be able to more fully understand the cause of the hereditary characters. Then he can be systematic in his crossing, breeding and selecting. Then he will accomplish things that we might think impossible now. It is not convenient for many of us to make crosses by hand pollenization and keep records of them. This is logically the work of the general government, because the public is benefitted more than the individual.

Most of us can save and plant seeds from the finest and best apples that have grown on trees adapted to our locality. We know that a variety of corn is improved by selecting the best ears for seed and that garden vegetables are made better by saving seed from the best beets and melons and tomatoes.

It is reasonable to believe that the favorable conditions which caused the apple to grow large and fine and develop good quality will exert a beneficial influence on the embryo trees contained in the seeds. I believe it will pay us who live in the northern part of Iowa to plant seeds of Wealthy, Fameuse, Duchess and Malinda, as these have already produced promising new varieties.

If a few scions of Delicious and Jonathan were grafted in the tops of the trees from which the apples for seed are selected it would probably not harm the quality of the fruit of the next generation.

A few years ago when I commenced to get a glimpse of the mysterious forces of life and heredity, my religious training had been such that in my ignorance I thought it sacrilege to assist nature in making the so-called new creations in plant life. I have since then come to understand that each individual in the animal and vegetable kingdoms is, in a certain sense, a new variety being different from any other.

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We read in Genesis that God gave man dominion over all other forms of life and placed him in the Garden of Eden to dress it and keep it. That he might be able to properly perform this task God created him in his own image, by giving him a calculating intelligent mind. With this divine authority in mind let us continue in conjunction with our Creator to improve and keep every tree that is pleasant to the sight and good for food.

MR. GARDNER: In listening to Mr. Black's paper, I notice that he speaks of Patten's Greenings. Now, Mr. Black has been up in what we call down here the cold north—in Minnesota—and has heard the reports of that society. I want to say to you gentlemen, that down here, without reading or paying close attention, we neither understand nor appreciate what Patten's Greening is until you go where it is the apple, and that is, from the north tier of counties in Iowa on north, and listen to these gentlemen make their reports from Minnesota and British America.

You also see the Brilliant on the exhibition tables there. Here is a man who represents the state of Minnesota, and if I say anything that is not absolutely correct, I hope he will correct me. You will see the Brilliant on tables and in boxes, and it is one of the most beautiful apples. Then there is the Iowa Beauty, which is a larger apple than the Duchess of Oldenburg; it is pronounced by experts to be of fine quality. The University, that is a newer apple, but it is taking the same course these others are, and you will find the first one I mentioned, the Greening, on their list to plant in Minnesota. If there is any apple that is hardy, that is one of them. Another one that has gone out for sentence to be passed on is the Silas Wilson. That has not been out long enough to receive the reports the others have, but in my opinion it is a better grade apple.

While I am on my feet I want to say, if there is any one in this audience who has in his mind any suspicion that there isn't much going on in our Experiment Station in Northern Iowa, I want you to go there and see for yourself. I took especial pains to go and look over Mr. Patten's grounds. I want to tell you it is a sight—row after row; hundreds and hundreds of trees which are ready to bear. They are loaded with fruit buds for next spring and we will then know what they will produce. There are crosses there, which to any one who will study the question at all, will raise his expectations something far beyond anything developed in the apple line. I do wish all the members of this society could know and feel just exactly as to what is going on there. You will find that half of it

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has not been told. I want to refer to the plums and pears. I know he has a great many pear trees there that look as though something valuable might result from them.

MR. CLEMONS: I have nothing to say for or against any man's efforts. I want to make a few remarks about the apple seed. I saw a statement not long ago, by somebody, who I thought ought to know better, that there were six apple seeds in an apple. Now, the facts are, in my estimation, there is always a possibility of 20 seeds in an apple. Each one of those seeds has a distinct individuality of its own; that no two seeds in any apple will ever produce a fruit or tree alike; they will always be a little different. As a matter of fact, some varieties have more seeds than others. But the possibility remains just the same for 20 seeds, and the highest I believe I have found was 17 seeds, in the Northern Spy. Those seeds saved and planted all grew and I think are all alive today and set in the row where they were planted.

MR. GARDNER: How old are they, Mr. Clemons?

MR. CLEMONS: Oh, they were planted, probably, seven or eight years ago; standing in blue grass sod; I never did anything with them.

MR. PATTEN: I only want to say that I am sure the members of this society will never expect Mr. Black to rise again and apologize when he takes the subject of "An Apple Seed," or upon any other subject he may choose to treat. He certainly treated that topic in an excellent way. I am sure I could not do as well.

MR. BLACK: I feel flattered because I would have preferred to hear this from no other man I know of than from my friend, Mr. Patten.

From what Mr. Gardner said, I think he possibly thought I took exception to Patten's Greening when I told about it being crooked. We all know it is crooked, but that is a benefit. It is better than a straight growing tree, because it prevents splitting. I would rather have one tree of Patten's Greening than two trees of McMahon. Patten's Greening very seldom blights, while the McMahon is a bad blighter with us. It seems to me in the course of time it is bound to displace the McMahon, although the McMahon is a good apple.

MR. GARDNER: I am no public speaker, and sometimes I convey the wrong impression. When I arose to speak I intended to compliment Mr. Black on his paper. I consider it a first-class paper from

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beginning to end. What I did mean to say was that he got a part of his inspiration on his visit to the sister state north of here.

MR. FORSTER: In conversation with a man who lived down in Kansas I was told that the center seed always produced the same variety of apples that the apple came from.

MR. PATTEN: Did he tell you where the center seed was?

MR. FORSTER: Right next to the center core; I wanted to know whether or not there is anything in it.

MR. GARDNER: There isn't a word of truth in it. No man knows what one seed will produce and what another will until the tree bears fruit.

CAPT. WATROUS: That tells the whole story.

THE PRESIDENT: I was in hopes we would discuss last night's papers. Some one spoke to me about discussing those papers, on the subject of "Grapes" and the Persian Walnut.

MR. PATTEN: As no one seems to arise to speak on the subject of grapes, perhaps I may be permitted to say something about the Walnut, not particularly of any definite walnut, except that I know of a Japanese Walnut, I believe, on Capt. Watrous' place that is some 8 or 9 inches in diameter, that is apparently entirely hardy, and the Captain, I believe, has quite a good many seedlings growing from that tree. I wish, however, to speak more particularly of our own walnuts and our hickory nuts, and what seems to me a real stupidity. There are no other words I can find to express my ideas as to the absolute lack of interest we attach to the hickory nut. It is to the upper Mississippi Valley what the pecan is to the south Mississippi Valley. It is a better nut and a sweeter nut; that is, it will keep sweet longer. It does not become rancid as quickly as the southern nut. We have here an exhibition of the shell, which Mr. Black brought to my attention; it is evidently a cross between the bitter nut and the hickory nut. There is a little estringency, comparatively left in it. Why can not we interest ourselves in this matter? We need to search the state and preserve the best there is left to us. It is a shame that we are not doing more than we are along this line of work. What is true of the hickory nut is true of the black walnut. We have a representation here of the thinness of the walnut. We should make an organized effort to save these native walnuts and hickory nuts that have been developing for centuries and centuries. If we allow them to pass away, the next generation or two will be laboring and laboring to bring back what is lost, just as we are doing now.

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I do think we are not giving proper credit to Dr. Dennis in the interest he has so long manifested in presenting to this Society an exhibition of the efforts and possibilities of the nuts for this upper country. To my mind, a year ago and two years ago, he did not receive half the premiums that he ought to have received for his work. I know, perhaps no one feels as I feel on this subject. I am an enthusiast, and a nervous one on this subject; I am ambitious over it. I wish our people could become harmonious in a united effort to ask our legislature for more funds to put men in the field to do the work that is needed in this state.

THE PRESIDENT: I am glad to hear these strong words, and I hope we can carry out just what you say. It is a shame we have let all these things go. The same thing might be said of the hazel nut. I have known one or two little clumps of hazel nuts that equal the filbert in size; I thought it was better. I would like to ask Mr. Patten what the quality of this Japanese walnut is?

MR. PATTEN: Capt. Watrous can tell you about it. I only know of it as a member.

CAPT. WATROUS: This Japanese walnut, or Persian has been there for 25 years. It generally bears if we have not a very severe winter. I know it is far more delicate than the black walnut; it is almost as good as the walnut we buy, the so-called English walnut.

A MEMBER: Has it a thin shell?

CAPT. WATROUS: You can crack it with the teeth.

MR. FORSTER: I would like to suggest that some member of this Society will bring a collection of these nuts. We have all sizes of black walnuts and thickness of shell, and also the different hickory nuts. I could have brought a half bushel of walnuts carried over from last year; they are just as good and firm as last winter.

CAPT. WATROUS: On the old farm back in the middle states, they always had butternuts in abundance. They were kept in a wood shed chamber, which was open below and shingled above. They were kept thoroughly dry and did not get strong. You will find if you keep whatever nuts you have dry, they will keep a long while without getting strong.

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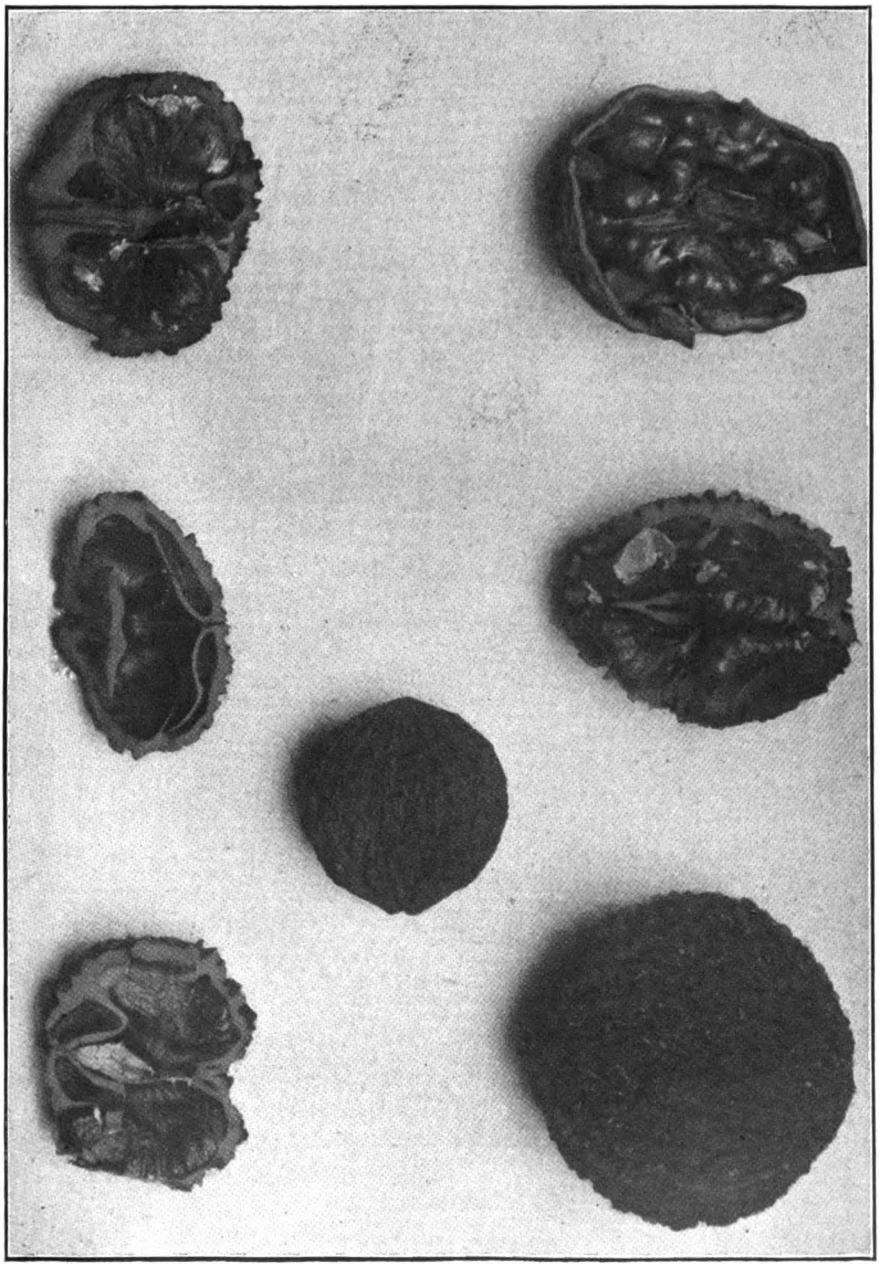

BLACK WALNUT

Showing size and thickness of shell. Persian walnut at right on top row.

—Photograph from C. G. Patten.

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THURSDAY AFTERNOON SESSION.

(Joint Session with the Breeders' Association.)

THE PRESIDENT: The first topic this afternoon is a "Report from the Storm Lake Station," by P. F. Kinne.

MR. KINNE: I have not prepared a written report owing to the fact that there was nothing to report. I might possibly have made a weather schedule and taken an account of the effects of the weather; but what we are looking for are results. We have had no results. There has been nothing but growth; so that I thought it useless to make a report. I think I picked 7 plums from 150 trees. All trees have apparently made a fair growth and have gone into winter in fairly good shape. That is all there is to it.

MR. CLEMONS: Has there been anything furnished for the Storm Lake work, for the last two or three years; if so, what?

MR. KINNE: I think nothing for three years. Nothing this year nor last year at any rate.

I have felt, that the least said under present conditions, the better for us.

THE PRESIDENT: We will hear the report from the Station at Williamsburg, by F. O. Harrington.

REPORT OF EXPERIMENT STATION. WILLIAMSBURG.

F. O. HARRINGTON, STATION KEEPER.

No stock was received from the Supervisory Committee of the State Experiment Station in the spring of 1910, but I did receive stock for test at the station under restrictions as follows:

From Harlow Rockhill, Conrad, Iowa, five varieties of his new everbearing strawberries, from six to ten each of his cucumbers, 2-6-7-8 and 9.

The season proved exceptionally unfavorable for such strawberries. Quite soon after they were planted came winter number two, injuring some of them seriously, of number six only one plant survived finally. Afterward came the long continued drouth of the mid-summer months, during which very few of my strawberry runners would root down. A little careful layering and covering of runners later in the season helped matters somewhat as to plants.

After the rains which came in the latter part of August, these everbearing strawberry plants bore some nice berries, but the conditions seemed unfavorable for any large amount. With a more favorable year I am hopeful that they would be much more productive. Of these varieties number

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nine proved the strongest grower and plant maker and number six made very little increase, but bore more berries.

I also received from H. J. Schild, of Ionia, Michigan, under restriction for test six varieties of his fig type strawberries, a few plants of each, as well as a few purchased, of Black Beauty and Grand Marie, also Schilds fig type varieties and the only ones he had offered for sale. The varieties under restrictions are M. O. No. 2B, M. O. No. 3B, M. O. No. 4B, M. O. No. 15B, M. O. No. 14P, and M. O. No. 19P. The plants received were all very strong, fine plants, many of them seeming to have a strong tendency to multiple crowns. Owing to the set back from the freeze, I picked the blossoms off them and so cannot give a report of their qualities in that respect. They are all vigorous growers, but one or two of them showed tendency to burning of the foliage during the excessive drouth.

The term fig type used to designate these varieties is applicable in pointing out their preservative nature, as they are claimed to keep perfectly in warm dry air for weeks and finally dry up, but still retaining their good qualities. This preservative nature is claimed for them in addition to very fine qualities in its natural fresh state in which the strawberry is ordinarily used. The plants are very satisfactory and promising and I shall watch with some degree of interest for next season's fruitage.

I also planted out a few of Red Prolific and Red Dawn, creations of Mr. Schild, but not of the fig type. I also have growing experimenting with, several new varieties such as Blaine, Collosus, Ey Ozark, Columbia First Quality, King Edward, Outlander, Oren, Goree, St. Louis, Norwood, Oswego, Gouldsborough, July 1st, Abington, Highland, Fremont Williams, New Oregon and some others that have been longer introduced.

I am indebted to Stark Brothers for their presentation of two vines of their King Philip grape, which have made fair growth. Much is claimed for the quality of this grape and its freedom from tough pulp and as having few seeds.

The three trees of Ironclad peach planted in spring of 1907 came through the winter of 1909-10 seemingly in pretty good shape, and with a few blossom buds still alive, but the belated winter in mid April finished these buds. The trees made fair recovery so that now they look promising, which few peach trees do in this section.

Of the hybridized peach pits (of Hills Chili;) planted spring of 1906 and the seedlings set in orchard the following spring, have largely gone through the last trying winter season without very serious injury and I think should blossom next spring.

Some of the trees of the Niobe Weeping Willow showed injury from winter conditions for the first time since I have had them growing.

Only one tree remains alive of the Burbank hybrid walnuts, the others have all been winter killed from time to time.

Of the various grapes planted in 1905 and 1906 I have little to report because of the severe set back of the last April freezes. They had been pruned quite close in wood, which made it much worse in the fruiting question after the freeze up. I have nothing to report on the fruiting of orchard trees because the April freezes caused the cleanest cut out of fruit that I have ever seen.

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The Blowers blackberry having been unsatisfactory all the time and being winter killed to the ground line last spring, I dug them all out, as also the Ward. I grew fifty plants from small root cuttings this summer, I shall plant out for test the coming spring.

THE PRESIDENT: We will next have the report from the Central Station, at Ames, by Prof. S. A. Beach.

PROF. BEACH: The work at the Station at Ames has been progressing along the lines outlined in my report last year. As I stated at that time, we are endeavoring to push the work at Ames along two general lines. The first line including long time experiments, those which will take several years, and the other, looking towards immediate results. In other words, looking at the Horticultural interests of the great State of Iowa, we realize, first of all, the necessity of doing all we can in order to help the orchard men and Horticultural interests as they are now. We wish to find out all we can that will be of assistance to them in the way of fighting insects and diseases and in the way of handling fruit in storage, and other questions of that kind. At the same time looking forward to the future of Horticulture we feel that there is a duty that this day owes to the coming years in trying to develope here in Iowa, as must be done, the varieties that shall be best adapted to this particular region. If we look at the selection of varieties that are grown in New Jersey and New York, we find that a very large percentage of them are varieties which originated in or near that region, and that it has taken nearly 300 years' effort and the survival of the fittest to develop them. In the Horticultural work of those early years of the settlement of this continent they hewed their farms out of the forests and planted often nothing but seedlings in the home orchards. In that way the planting of seedlings was carried forward on a most gigantic scale. From such plantings came the Northern Spy, in Central New York; the Maiden Blush, Winesap and Yellow Bellflower in New Jersey; the Baldwin and others of the old New England varieties, which are prominent on the fruit lists of the East. But at the present time there is scarcely any planting of seedling orchards. How many people are there in Iowa who are growing apples from seeds? The modern plantings consist for the most part of trees propagated by budding or grafting from the old cultivated varieties. So what our orchardists have been doing in Iowa is testing the cultivated varieties from other parts

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of the world. We have thus not only tested those that have come from the eastern parts of this country, or from other parts, but have also tested those from Europe and particularly those from Russia. We have done this testing pretty thoroughly and extensively for the last fifty years or more, so that we now know pretty accurately what there is among the old varieties that is of value for this section.

The Ames Station is co-operating in a limited way with the splendid work Mr. C. G. Patten is doing, in his endeavors to breed varieties of orchard fruits that shall be better for this region than any we have now. This is work which goes slowly. It takes years to get pedigreed orchard fruits with known parents, grand parents and great grand parents. Moreover, we have to start with mongrel races, for there is the blood of practically all of our orchard varieties, a mingling of characters which have been handed down from a mixed and mongrel ancestry. Therefore, the scientific breeding of orchard varieties is not an easy task, nor one which the practical Horticulturists of the state are willing to undertake alone and unaided.

There is also another line of long time experiments which has been undertaken at Ames, that is, testing stocks upon which to topwork orchard varieties. We are carrying on this work with different fruits, but particularly with the apple. We have tried to select varieties which are especially hardy as stocks to topwork with some of the varieties of better quality which are less hardy. For example on Silken Leaf stock we are working the Winesap, Grimes Golden, Jonathan and other varieties of much better quality than Silken Leaf but less hardy. This experiment is young, for the land on which it is located was just bought about four years ago, we have made a splendid start and we are getting results which are beginning to show already. One of the best stocks shown by the test thus far, although it is too early to pass final judgment, is the Silken Leaf. I wish particularly to call attention to this as probably a desirable stock for that part of the state north of Des Moines for those who wish to grow varieties like the Roman Stem, Grimes Golden, and Jonathan. I believe it would pay practical orchardists to begin some experiments of their own with the Silken Leaf as stock. The Central Experiment Station at Ames cannot carry on all such experiments as are needed to get a final verdict on these orchard stocks. What we need is co-operation, so that we can get definite information from practical fruit

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growers in various parts of the state. Then by summing up the results of those who have made trials of these stocks a more satisfactory verdict can be reached.

A MEMBER: What is the Silken Leaf?

PROF. BEACH: It is very much like the Hibernal. It will get on to its own roots a little quicker than the Hibernal, thus insuring a root system as hardy as the body of the tree. Those varieties which we have tried on it are making a splendid union, but as said before it is as yet too early to pass final judgment.

I wish to say here a word parenthically: This Society some 15 years ago started an experiment along this line on an acre of ground at Waukee, near or on the old Wragg farm. This orchard was first planted with different stocks and afterwards topworked with different varieties. I think Mr. Jerry Saxton of Ames did the top working as directed by the experiment committee in charge. We have secured through the assistance of Mr. M. J. Wragg and placed on file in the Station at Ames records and photographs of those trees. I believe it would be a splendid thing if this Society would rent that acre of ground for a term of five or ten years and thus make it possible to get good records of the results of those efforts. The orchard is not now under the control of the Society. It now represents the result of probably 15 years of labor. The Society as a Society is interested in these results. It is a good experiment; it ought to be under the Society's control. I believe it would not cost very much for annual rental for that acre of ground. The records now at Ames are practically complete and accurate. I could not say who is the owner. We had permission from the owner, through Mr. Wragg, to take photographs and have brought the records complete down to date. You will find interesting results. For example where two varieties were grafted on the same stock in one case one has made a fine union and outgrown the other and crowded it out, so that perhaps only 10 to 20 per cent of the top is of the one variety, while from 80 to 90 per cent of the top is of the other variety, where they originally had the same chance.

MR. BOMBERGER: I think there is some topworking at Woodbine which is 30 years old, in the old Pugsley orchard. I think his son is connected with the Nebraska extension work.

PROF. BEACH: If any of you know of definite records of topworking, we would be glad to get hold of them.

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Speaking of the orchard breeding, we have a large number of trees and varieties in the Station orchards which we have developed in the breeding work. We should be pleased to have any of the members of this State Society to come to Ames and go over the orchards with us and see the results we are getting along the line of orchard breeding and along the line of testing, stocks and other work which we regard as important to the development of Horticultural interests in this state. It is also valuable to have that material there as object lessons for the College students. The student body is rapidly increasing; where a few years ago we had 25 or 30 in one Horticultural subject, we are expecting an enrollment this coming semester of 250. It is a serious problem to know how to furnish equipment and room properly to take care of so large a body of students. This, however, is a side of the work I was not asked to report upon here.

Aside from the Station work already spoken of there is the work which looks toward aiding the fruit growers of the state to get better results from what they now have on hand. We have started some work along the line of potato experiments. Mr. Greene has charge of all that. I believe we are going to get some valuable results from this work as also in the comparison of spray mixtures. Mr. Greene in the work at Council Bluffs this year got some interesting results along this line. He has also been continuing the work of testing Iowa apples in cold storage. A limited experiment in a comparison of the bordeaux mixture and lime-sulphur, for the treatment of the apple orchards, was started in the Spring of 1910. After the experiment was started we thought the whole crop was ruined by the late frosts, but eventually found that enough fruit was left so that we got some results. This orchard yielded over 400 bushels, largely Wealthy, Rawl's Janet, Grimes, and one or two other varieties. One variety, called Cambridge, was full of fruit. Any variety which bore fruit this year was of interest from the standpoint of hardiness of fruit bud. The season was such that there was practically no scab on the trees, so that we were not able to get comparative results on the matter of controlling apple scab, but did get indications that the treatment with bordeaux mixture resulted in more injury to foliage and fruit than did the lime-sulphur treatment. We plan to continue these experiments another year and hope to get results worthy of publishing.

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REPORT OF THE IOWA HORTICULTURAL SOCIETY FROM THE CENTRAL STATION AT AMES, 1910.

S. A. BEACH, STATION KEEPER.

VARIETY TESTING.

From the early history of this Institution more or less attention has been given to maintaining a collection of fruits and of trees and shrubs for ornamental planting for the purpose of securing information as to the hardiness of different species and varieties, their adaptability to the climatic and soil conditions of this region, their economic value and their usefulness in ornamental planting. Not a year passes that the Station does not receive a considerable number of new varieties which are sent here by parties in various localities in Iowa with the request that they be tested in the Station collection where they may be given an impartial comparison with other new candidates for favor as well as with standard sorts. Besides this inquiries are being received concerning prominent new varieties, which makes it desirable that they be placed under observation on the Station grounds. In spite of a constant effort to restrict the variety testing to narrow limits, the aggregate number of varieties under test is large and this work requires much time and involves considerable expense.

Study of Orchard Varieties. In the general study of orchard fruits for Iowa particular attention is being given to the apple, plum, and cherry. A little work is being done with the peach, pear and other fruits of local importance. The following statement shows the number of varieties and number of trees of different classes in the Station orchards in 1910.

NUMBER OF TREES AND VARIETIES OF DIFFERENT KINDS OF FRUIT WHICH WERE IN THE STATION ORCHARDS JUNE 30, 1910.

Kind	No. of trees	No. of varieties
Apple	2,047	540
Pear	85	43
**Plum	402	225
Cherry	68	31
Peach	41	15

** Including sand cherry and hybrids.

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VARIETIES ORIGINATED BY AMES STATION

Kind	Parentage Known		Parentage Uncertain	
	No. trees	No. varieties	No. trees	No. varieties
Apple	1,483	1,473	436	418
Pear	319	319	3	3
Plum	275	267	29	29
Cherry	------	------	37	37
Peach	452	452	61	61

This makes a total of all trees and varieties as follows:

Kind	No. of trees	No. of varieties*
Apple	3,966	2,431
Pear	407	365
Plum	706	521
Cherry	105	68
Peach	554	528

* Including also the unnamed seedlings which have come to the station from outside parties.

In addition to these orchard trees there are several thousand Station seedlings of various fruits under test in the Station nurseries.

APPLE STOCKS FOR TOPWORKING IN ORCHARDS.

In many parts of Iowa varieties of the better class of apples are not reliably hardy and often are not long lived, in consequence of which in many sections of the state the planting of them in commercial orchards is regarded as an investment which involves great risks. There are varieties which are reliably hardy even in the northernmost limits of Iowa, but unfortunately this list includes only a very few winter apples and those are not of the best. The question has often arisen whether some of the less hardy kinds of better quality would be more reliably productive and longer lived if topgrafted in the orchard upon some of the hardiest stocks. This matter has been taken up for systematic and thorough investigation. In 1906 one entire orchard was set apart for this work and planted with various kinds of very hardy apple stocks for the purpose of topworking them with the more important commercial varieties. This experiment is now well under way and is increasing in value with each year's growth of the orchard.

In addition to this experiment work, data are being collected showing the results of the use of different kinds of stock for the apple in various parts of the state and also in adjacent regions. A great deal of valuable information is thus being secured which it is hoped may be put into bulletin form within the next year for the information of the apple growers of Iowa.

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PLANT INTRODUCTION.

The estabishment of the Upper Mississippi Valley Plant Introduction Garden at Ames in the summer of 1907 and its relation to the work of variety testing and plant breeding has been noted in previous reports from the Central Station published in the Annual Reports of this Society.

David Peach. In the report for 1909 special mention was made of the Asiatic species of wild peach, *Amygdalus davidiana*, or David peach, calling attention to its vigor and hardiness. At the close of another year it can be said that this species is maintaining its previous good record at Ames, both for vigor and hardiness. It passed the winter and spring freezes with practically no injury to the wood. The twigs commonly started growth from the end bud. The leaves were one and one-half inches long or more at the time of the spring freeze, April 16, which destroyed all the foliage, but within a short time new leaves appeared and the trees have uniformly made a satisfactory growth during the season. The more mature trees are now full of fruit buds and it is hoped that we may be able to see the fruit of this species in 1911. It is understood that the David peach is not valuable for its fruit, but it has been recommended as a hardy stock upon which to grow other stone fruits, including the cherry, apricot, and peach. Possibly it may prove valuable as a parent stock to be used in crossing with our cultivated peaches for the purpose of breeding a hardier race bearing desirable fruit.

Pyrus betulaefolia. So far as tested here Pyrus betulaefolia is making a good vigorous growth and has stood the drouth and heat of summer and the climatic extremes of winter remarkably well. Professor S. B. Green reported that seedlings of this species which ne grew from fruit received from the Arnold Arboretum, Boston, Massachusetts, blighted badly at St. Anthony Park, Minnesota. The species has not yet blighted at Ames, but possibly the material at Ames represents a different strain of the species from that which was tried by Professor Green. On account of its vigor and hardiness, it appears worth testing as a stock upon which to topwork the less hardy cultivated varieties of the pear. Seckel, which has been budded on this stock, is making a fine growth in the nursery row.

Evaline Apple. This variety originated as a chance seedling many years ago in Wisconsin. Its origin and record are given in the Iowa Horticultural Society Report for 1908, page 396. It is a green or yellowish apple of good appearance and good quality. The tree as grown at Ames is hardy and productive. It comes into season here late in the fall and it has been kept till mid-winter or later. It appears worthy of testing in Southern Wisconsin, Southern Minnesota, and Northern Iowa.

Populus balsamifera suaveolens. This is a rapid growing tree with habit somewhat like the Lombardy poplar. Mr. Frank N. Meyer, who collected it at Shiling. Chihli, China, in 1908, remarks as follows in Bulletin No. 137 of the Bureau of Plant Industry: "A remarkable variety of the small-leaved Chinese poplar; looks like the Lombardy poplar, but makes a more pleasing impression. Loves a sandy, moisture-retaining soil." It appears to be worthy of trial where a tree of the Lombardy poplar type is desired.

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DISTRIBUTION OF MATERIAL FROM THE PLANT INTRODUCTION GARDEN.

Limited quantities of the above described varieties have been propagated for the purpose of supplying them to nurserymen and other horticulturists who may be interested in helping to find out their value for this region. As a rule but one plant of a kind is supplied to each applicant. Applications may be addressed either to the Horticultural Department of the Experiment Station, Ames, Iowa, or to the Office of Plant Introduction, Bureau of Plant Industry, Washington, D. C.

Colorado Orange Apple. No stock of the Colorado Orange apple is on hand for distribution, but it is desirable to call attention again to this variety because of the good record it has been making in at least one locality in Northern Iowa. It is a rather attractive yellow apple of good size. It keeps well into the spring in Northern Iowa. In fact its quality is better in late winter and spring than it is early in the winter. Flavor subacid, quality good. It keeps excellently in cold storage.

This variety has been disseminated by the Rice Nurseries of Council Bluffs. H. J. Kyle of Bristow, Butler County, has 250 bearing trees of it which have made a good record for hardiness and productiveness. These bore some fruit this year which, considering the unfavorable spring, indicates a good degree of hardiness of fruit bud. Specimens from Mr. Kyle's orchard are on the exhibition tables at this meeting. A brief account of the Colorado Orange appears on page 395 of the Society's 1908 report.

PLANT BREEDING.

A detailed account of the plant breeding work at the Ames Station was given in the report of the Central Station for 1909. This work has been continued during 1910 along the lines indicated in that report. As stated in that report, arrangements were completed in 1909 for cooperative work in the breeding of orchard fruits to be conducted by Mr. C. G. Patten on his grounds at Charles City, Iowa, in cooperation with the Bureau of Plant Industry of the United States Department of Agriculture, the Iowa State Horticultural Society, and the Iowa Experiment Station. Under this agreement the Iowa Experiment Station contributes the use of its propagating grounds and of its expert employes to further the general line of work so far as possible. Mr. Patten has gained results in this kind of work during the past forty years or more, which have given him a national reputation. He has developed on his grounds a unique and valuable collection of pedigree plants which are found nowhere else. Besides this he brings to the task ripe experience, expert knowledge, and a rare enthusiasm for this kind of work. The State is to be congratulated upon the establishment of this cooperative work with Mr. Patten.

THE PRESIDENT: "A Brief Resume of Horticulture at the Experiment Station at Charles City," is the next topic, by C. G. Patten, Charles City.

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A BRIEF RESUME OF THE CHARLES CITY EXPERIMENT STATION.

C. G. PATTEN, STATION KEEPER.

Could I present to you an enlarged photographic view of the rows and blocks of apple, plum and pear, in their different sizes, using them as a text for some off-hand remarks, it would be a great relief to me, as I feel sure you would get a more comprehensive idea of the work that is being done here than by this writing. For I am solicitous that this society shall get a true conception of the importance of the work which has been and is being done at this Station.

I have been very desirous that more of the members of the society should make a personal inspection of my grounds, even in this year of non-bearing trees, so that they might see for themselves what is being done.

It was greatly disappointing to me, when meeting Mr. Bomberger at the Conservation Congress in St. Paul, to learn that his time and ticket were so arranged that he could not come by the way of Charles City and spend at least a half day with me; for, we are doubtless all agreed that this state organization should know as much as it can of the height, depth and breadth of this scientific fruit breeding effort.

Beginning on the east side of the especial experiment ground; skipping a row of trees used for top-grafting; also a row of some forty apple five years old; three rows of one and two year plum; five rows of three year apple, very thickly set in nursery rows, a part of the special effort of the season of 1907; a few pear; also another row of five year grafted seedling plums; two rows of two year peach; and another half row of select apple now six years old—a total of thirteen and a half rows. We now come to a row of select apple, twenty-eight in number and nine years old, composed of eight different parent stocks. This row shows the possibilities of breeding by "Selection". Scarcely any known variety can be named which would produce as fine trees from grafts, either in vigor or in general appearance, that would equal twenty, at least, of these twenty-eight seedlings.

West of this row are two rows of bearing plums.

The next a full half row of pear, seedlings of several sorts, select and hybridized.

The next is a full row of apple nearly all crosses of Ben Davis and Black Annet with Patten Greening. They are eight years old. Nearly all of them would have fruited last spring except for the late severe freeze.

The next is a row of like age with several sorts of crosses.

Two-thirds of the next row is of the same age and composed of six different kinds of crosses, a few selects and the remainder of cross-bred pear.

Beyond this there is a row of seedling raspberries, a row of seven year apple and several rows of seedling plums, before we come to the large block of older cross-bred and select apple made twenty-one years ago.

On page 461 of the Report for 1895, is the beginning of an illustrated

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article directing the attention of plant breeders to the last three rows of cross-bred trees written of in this paper; calling especial attention to the noticeable influence of the male parent in the crosses in these rows. Having recently read that article, I can not see wherein it could be changed in any essential particular. The male parent has strongly dominated in the form of the tree as well as the character of the limbs. So the breeding of form in apple trees is no creature of the imagination, but is a scientific fact of no small value to the orchardists of the future.

The rows which we have been considering (27½ in number) are, with but few exceptions, eighteen rods long; the apple and pear set four feet apart and the younger plums averaging less than half that distance—too close for best results, but, to have things just right, where there is so much, requires time, thought, money and ground.

Looking back over a long series of years, it seems that mishaps and discouragements are of no small moment in an experimentor's experience. For example, the weather conditions during the last two years have nearly destroyed the breeding work at all of our stations.

Continuing my efforts to improve the pear, a year ago I did some earnest work in securing seeds of the Fluke, Longworth, Keiffer, a Wisconsin Seedling and the Warner—more than five hundred seeds, nearly all of which were inbred with the exception of the Warner, together with as many apple seeds; and, in preparing and taking them to the greenhouse for greater surety of germination, in some unaccountable way, I met nearly a complete failure, but I shall try again if I live until another fruitful year.

Of plums under test here 5 to 9 ft., there are one hundred and forty-eight; 3 to 6 ft., over three hundred; 1 and 2 years, two hundred and eighty; (a total of 656), besides the trees that have borne: Peach, one and two year old, seed almost all grown in this county, one hundred and sixty; pear, bearing size, fifty to sixty; 7 to 9 ft., fifty; 3 year, seventy-five; 2 year, fifty-six; in all, some two hundred and forty trees.

Already a full quarter of a century has been put into this effort to adapt the pear to northwestern climatic conditions, or better as now expressed, "The Upper Mississippi Valley" climate. Many of these trees are cross-bred, some inbred, and all selected from the very best possible parentage to meet the demands of this climate.

No one need be told that any possible pecuniary reward is so remote for any individual experimentor that he must look to other sources for a living while he develops this line of work.

And what is true of the pear is largely, yes, almost wholly, true of the apple—only with some exceedingly fortunate exceptions, can one hope to realize, in money, any adequate return for his labor.

Nearly one hundred of the eight year, cross-fertilized apple trees, comprising ten different crosses, together with some fifty select seedlings of the same age, many of which are most promising, should bear their first fruit next year. Very many of the plums and pears, also, should come into bearing another year.

In order that we should know more about these trees when we see their fruit, I have gone carefully over them, marking by number, in a book,

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both of the apple and pear in each numbered row, those trees which ripened and shed their leaves by Nov. 20th, that we might be the better able to select the hardiest ones for future observation and propagation, if worthy.

The two seasons past have been so trying on young nursery trees that, until late in the season, I had been so discouraged by the prospect for the very large number of both cross-bred and select trees that I had decided to postpone any farther experiment with them until another, and, hopefully, a better season's growth. But, on more mature reflection, I concluded that two years in succession, which had compelled growth at the wrong end of the season, furnished about as good a test of hardiness, vigor and quality as would be likely to appear. So, taking our foreman with me, we selected, with most careful scrutiny, three hundred and sixty apple and twelve pear out of several thousand hand crossed and selected trees, cut scions, labeled and numbered each tree and scion of a given cross, preparatory to transplanting and top-working each tree upon bearing trees, in the spring. And I feel free to predict that, if we have just normal seasons for the next three or four years, whoever sees this selection, at that time, will utter only exclamations of surprise for such a remarkable collection of seedlings. They are drawn from twenty-three varieties of crosses and twenty sorts of the most carefully selected combinations that it was possible to make for our purpose; and, I feel sure that results will fully justify our confidence in them.

That you may the more fully comprehend the magnitude and importance of this work, I will enumerate some of the varieties that have been made to contribute to these experiments: Canada Baldwin, English Russet, Malinda, Seek-no-further, Silas, Delicious, Roman Stem, University, Jonathan, Wealthy, Rawl's Janet, Patten Greening, Iowa Brilliant, Talman Sweet, Pound and Briar Sweet crosses, W. W. Pearmain, Grimes and its crosses, Patten Greening and crosses, N. W. Greening, Stayman, Willow Twig, and natural reciprocal crosses of many varieties by the most careful selection which, from their breeding and the offspring which they produced, can not help yielding most valuable results.

Words seem tame to me for the expression of what I see if we will but have the courage, the wisdom, and the patriotism to watch Dame Nature's munificence of variation in plant life, and eagerly and thankfully accept her choicest offerings.

What is this society here for? Is it to recount our losses, to lament the destruction of our fruits by bugs and worms, by drought and floods, by heat and freezing blizzards, or is it to have an optimism that knows no command but, "Forward, march!"; to ask our state to support, as becomes this magnificent commonwealth, our State Horticultural Experiment Stations; and to honor the men who meet year after year giving of their time, money and talents, almost wholly as a missionary effort, to instruct our people how to make the home and its surroundings more cheerful, more useful and more beautiful? Other states do better than we, and the more favored ones adjoining us have scarcely so much of wealth and opportunity.

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Pardon me when I say, that what our society needs above everything else is more unity: more patriotic pride in the work we are doing, more and higher ambitions and aspirations to make and to be worthy of the heritage of both soil and climate of this Central Upper Mississippi Valley.

I have not mentioned the more than fifty, two year, cross-bred Black and English Walnuts which should be transplanted next spring; neither of the comparative difference of Catalpa trees to produce seeds and seedlings of commercial value. The experiment, though conducted on a small scale, is very instructive and very hopeful of rapid improvement in this valuable forest tree. After another year's growth, I shall endeavor to have a photograph to present to you of this planting.

Have only bearly mentioned the older cross-bred and select trees, some of which should undoubtedly be used in the farther scientific advancement of this work. Neither has mention been made of six rows, twenty-two rods long, of three year cross-bred and select seedlings, set eight to ten inches apart.

A railroad, cutting its way through my grounds, compelled me to move twenty-eight experiment pear trees and ten apple, from one and one-half inches to nearly four in diameter, at a cost of not less than fifty dollars, but I had put a quarter of a century into this effort for improved pears for this region and they must be saved.

Fellow members, I have placed my work before you as well as I am able without your seeing it. If this presentation appeals to you as being worthy of your support, then it appears to me that I should know it in such a business like way that no personal friend of mine should feel it a duty to use his personal influence in this society to secure justice for me.

I am not a debtor to the state of Iowa nor to any other state in the field of horticultural progress.

I am exceedingly grateful for the many courtesies that I have received, both from within and without this society, and for the material aid which this horticultural society has given me in the work wherein the best energies of my life have been spent for more than thirty years, in a magnanimous spirit to raise my state to the level of the high purpose of any other, to search out and bring, not alone for our people, but to the inhabitants of this Upper Mississippi region, all of the best there is in horticulture for them.

MR. PELLETT: I was going to ask you what you said about the Catalpa.

MR. PATTEN: It was just merely the selection of seeds from the hardiest trees that have been distributed about Charles City. I have one especially in mind that has surpassed all others in timber-like character of the tree. I have about five or six I planted seeds from. The seeds vary so greatly that one at all acquainted cannot help but be interested in them.

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I made a reference to the use of older apple trees for experiment work; among them is the cross of the Patten Greeing with Grimes Golden. Of course, when this work was begun at Ames by the State Horticultural Society, and when I began, we knew practically nothing about this breeding work. We knew a little of the theory. You men who have given attention to it know, that more has been developed in the real knowledge of scientific work in the last decade, than was known before in a hundred years previous. So when I showed you last year or the year before some samples of these crosses; one almost identical in appearance with the Grimes Golden; another two sizes larger than the Grimes Golden, and having had the same color of the Grimes Golden, had any of us known just what to have done when these apples appeared, we would have immediately inbred them, and cross-bred them again to secure what we were after. We had to wait for this spirit of breeding to take hold of some of the younger men, like Prof. Hansen, Prof. Emerson and Prof. Harrison, and taking into consideration the work that Prof. Beach has done, I want to particularly call attention to the work of Prof. Emerson in Nebraska. I have known and seen something of the work over at the exhibit at Omaha, in selecting two varieties of corn and breeding those varieties together, and the result was a lot of mongrels, perhaps none of them coming up to the value of either variety, but in the next generation there developed something very much improved, both in the second and third generation. So the same thing will be true with the apple when you come to do that. But it has taken us a long time to learn how to proceed; we know better now and can go faster.

Then I might call attention to the history of breeding the orange by Prof. Webber. If he in one generation produced an orange of medium value 300 miles further north, it is accomplishing a great thing. It is a thing that we in the north should take notice of.

You have listened to Mr. Gardner; you know about his work now and how very important it is, because it is corroborative of all the other breeding work. I have spoken of what Prof. Emerson can do with grains, and what Prof. Hansen did at Ames under Prof. Budd. I was almost at the point, and I think I will say it, under much of the instruction of Mr. Watrous and Mr. Patten, during those years. We tried our very best to get Prof. Hansen to look at it in a different light from what he was seeing at the

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Ames station. I think we have left an impress upon that young man's mind which has given to us one of the most valuable experimenters in the Northwest. Prof. Haralson also is doing valuable work. I should like to hear from him at this meeting.

Now, I come to a point that is a little personal to myself. We have heard it talked one time or another, of the great expense this magnificent commonwealth was paying out for the development of these fruits and for the improvement and beautifying the homes of our state. Why, gentlemen, it is scarcely anything to speak of, in comparison with the great benefits that may or should be derived from it. Now, I want to say to you, in my individual work, I have produced one apple that you have heard of here many times, that is worth more in material value to the tier of Northern counties in the state of Iowa, and the whole state of Minnesota, and to all of Central and Northern Wisconsin and the Dakotas, it is worth more than ten times what the state of Iowa has ever put into horticultural work. I believe there are men who will bear me out in that statement. Why should we hesitate to ask the state, in view of all these things, for a liberal appropriation, that we may put men into the field to develop our horticultural interests in Iowa, which will redound to our material prosperity as well as to the aesthetic value which it would carry with it?

THE PRESIDENT: The next paper is entitled, "The Duty of the State in Plant Breeding," by C. L. Watrous, Des Moines.

If I had been a prophet and known there would be here this afternoon the reports and exhortations of Prof. Beach and Mr. Patten, I should not have thought of writing a paper like this. It is only but a very brief one. I know this work of breeding is a long work and you have to wait a great while for results, and men often get discouraged. I am an old man, but I remember how, in 1864, when the soldiers had had three years of hard fighting, there was almost a majority of the people in the North who said, this whole thing has been wrong, been a failure, let us drop it; let us do something else. There was a great question whether Abraham Lincoln could be elected on the platform of his party declaring for a continuance of the war. No man knew what the result would be, and the next spring the whole rebellion collapsed. So it was because I know, so many men get discouraged because they do not get immediate results from the breeding of fruits, that I thought it was best to say something by way of encouragement, and now

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I will read the few words I have here, and may have something further to say afterwards.

THE DUTY OF THE STATE IN PLANT BREEDING.

C. L. WATROUS, DES MOINES.

Very much might be said upon the subject assigned me and yet nothing unnecessary said. It may be useless to take your time, nevertheless, unless somebody takes up this question and discusses it in such a way that others will act wisely and persistently, there can be no doubt that this rich prairie region will be scantily supplied with fruit during a time too long to contemplate.

Last week was held an important meeting in this city, attended by men of note. They discussed ways and means to improve the corn crop. They agreed that the state should be called upon to assist in this work, yet for every reason why the state should help in breeding and growing corn, are at least seven reasons why the state should help in breeding new varieties of the apple. Any man may breed corn this year, plant the seed next spring and in the autumn know what he has. It will take at least seven years on an average for the same man to breed an apple, plant the seed and begin to know what he has. To properly test the value of a new apple will require at least 25 years. Counting periods of seven years, the man who is likely to attempt to improve our varieties of apples by breeding, will not live long enough to raise more than four or five generations of apples after he is old enough to undertake the work. That is to say, only one-seventh as many generations as the same man could produce of corn, or other annual crop. One man's life is too short to permit hope of much success. "Art is long, but life is short" is as true now as ever it was. Besides this, under our laws, any man may rob a creator of a new fruit of his property without fear or danger. If a man invent a mechanical device worth a dollar, all the courts and all the armies of the nation must protect him. The creator of a new fruit worth millions to a state, is not protected at all.

All of us older men realize that during the past 40 or 50 years, our progress in securing varieties of the apple better adapted to prairie conditions, has been disappointing. That is because we have not worked in the right direction. When men desire better varieties of animals produced, or grains, they proceed to breed for what they want, in the region where they want it. We have tried to succeed by using the labors of other men near the sea coast, a region of forests and moisture. It is safe to say that we shall never succeed while we travel that road.

A dealer of apples in the city of Des Moines, told me the other day that he had bought apples outside the state and sold them inside the state this year to the amount of $50,000. In his judgment, others had handled as many more and the rest of the state had handled enough to make it at

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least half a million. He said he believed the state had handled about this amount of apples annually from the outside during the last five or ten years. Adding to this half million, the immense amounts spent for semi-tropical fruits,—oranges, bananas, the so-called grape fruit, etc., we can see what a loss the state sustains through the lack of fruits well adapted to our own soil and climate.

If this work were carried on properly by the state, the work of every worthy breeder of fruits would be recorded. The worker in the pay of the state would be required to tell what combinations he made and why he made them with a view of securing certain desired results. When he laid down the work, another could begin substantially where his work ended and go forward. Progress in that way would surely come. In every line of animal breeding, thoroughbreds already exist, whose progeny can almost be described in advance; in apples, the opposite is true. The finest apples in the world are of unknown origin.

The first settlers of New England and the middle states planted apple seeds and seedling orchards, because they were too poor to have orchards of known varieties; but they planted abundantly, millions of trees, in the aggregate, and the work went forward for 200 years. On the old hill side, where I was born, I stood a few months ago and counted ten of these seedling orchards within sight and within a distance of a short rifle shot, that is to say, all within less than a mile. When men learned to make trees in quantity by root grafting, they ceased to plant seedling orchards. Civilization, which in 1840 was largely confined to the sea-board states, began to spread rapidly over this immense inland empire of grass. There existed here native apples and plums of much better quality and size than the plums and apples of Europe, from which the finest varieties have been developed, and from which have come all our cultivated apples and the so-called domestic or sweet plums.

For many years men tried along the sea-board to grow the grapes of Europe, but failed until they grew the grapes of American origin. While it is true that seedlings of European apples succeeded admirably in the sea-board states, especially before the forests were destroyed, it is more and more apparent that the struggle to produce from them varieties suitable to this inland region, is to be a long and difficult one. There is good reason to believe that efforts may well be made to improve certain hybrid varieties of our native apples. Such questions could be settled by men who would undertake this work under state encouragement, and the results made known.

What is said here is not with any expectation of accomplishing much, but, on the other hand, not without some hope—the hope that younger men will consider these questions and carry forward the work which old men have to lay down. To plant the small flint corn of the east on these prairies, in competition with our well adapted varieties, would be an act of folly. To depend for success in apple growing upon the eastern sorts, bred to fit different conditions, is no less foolish. Some day we must do differently.

After concluding his paper, Mr. Watrous said:

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In a talk I had once with Prof. Bailey, I mentioned the trouble we had here. I said that before ever we succeeded in fruit growing in this region, we should have to breed an entire new pomology. He said: I shouldn't wonder but what you will have to do that. I know some of the members of the society were impatient because some of the money has been given to this breeding work. Yet, I am satisfied, that it will soon be known, that that is really the valuable work we are doing. If we carry on this work and see the results that we will have in one or two good fruit years, I will have no fears of the results after that. I do not think that anybody here is so dull as to think of stopping that work, which has been done so successfully and which promises so much. If we should stop now—we couldn't stop it—but we could hinder it, we couldn't punish him very much, but we could show the heighth and depth of our wisdom or lack of wisdom. I am as satisfied as I stand here, that when the history of the pomologists of this state is considered 50 years from now, some of us may have our names mentioned; but of all here today, there is not one who has any such chance of having his name remembered for the great work he has done, as Charles G. Patten. Those of us who are able to help him, may take praise to ourselves, because we have helped in the worthy work. Those that hinder will, if they live, and I do not think they will have to live so very long, will live to regret bitterly what they have done.

I shall begin to preach if I stand here much longer, and therefore I will sit down.

THE PRESIDENT: I feel confident there is no disposition to hinder Mr. Patten's work. Our only regrets may be after a while that we do not give him more hearty support.

MR. PATTEN: Let us hear from Prof. Haralson.

PROF HARALSON: I can only say to you, that our work is just begun. It has been scarcely four years and final results we have not got. Therefore there is very little for me to say. We are working along several lines of fruit breeding, taking up strawberries and raspberries and the plums. I think we are doing splendid work in plums—trying to improve the native plums by crossing with the Japanese varieties. We have pretty close to 500 seedlings of these hybrids and they look very promising and make a good growth. Many of them are two year old trees. What the final result will be I cannot now say.

MR. PATTEN: You have some development from the work in South Dakota.

PROF. HARALSON: I was working under Prof. Hansen's directions there and am pretty well acquainted with the work he is accomplishing out there. He is doing wonderful work and will

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turn out something of value for the Prairie Northwest. It takes time to do it, but I am confident he will do it.

I will say further about Mr. Patten's Greening, we think a whole lot of that in Minnesota. It is perfectly hardy. It is one of the farthest north growing apples we have, with the exception of the Duchess which grows as far north. I do not doubt but what he has several other varieties as good, like the University and several others, but they are not yet so well known.

MR. VAN HOUTON: I consider the hope of the future for Iowa is along the line of these discussions we have just been having. I am slow to pass to the next paper, if there is anything further to be offered along this line.

MR. BOMBERGER: I would like to say something on this subject, but have hesitated a little bit because of greater authority and better posted men who should have the right of way. In a practical way, of course, to any results we can get and are glad to get them, and we are particularly glad to have the service of these pioneers Prof. Beach mentioned about topworking. Let us look at the work of Mr. Parsons, located north of Central Iowa, or in Central Iowa. He has placed a collection of fruits on his grounds by topworking that came from different parts of southern Missouri and Illinois and Indiana, simply through topgrafting these scions on hardy stocks. I think the varieties that grow in southern Iowa can be easily grown in Central Iowa by that method, or in northern Iowa. It is simply pushing the fruit area north. We have done quite a little of it on our own grounds. The Grimes Golden is benefitted on our soil by being topworked on other stock. It is much longer lived; instead of being a 25-year tree, it can be made a 35 or 40-year tree by topworking in our section. If you want a list the bloom of which will stand frost best, the Jeanett, Ingram, Roman Stem, and the York Imperial have the best blooms. They stand the frost about as well in the spring as the Wealthy. There isn't a farm in Central or Northern Iowa but what can grow the finest apples in the Northwest if you will just topwork them on the right stocks.

MR. REEVES: I believe when we get a new variety and it is valuable, we ought to stick to it. There are two apples I want to speak of especially, and I believe it would pay every fruit grower to plant them largely through the Northwest. Mr. Patten has produced a number of them which I will mention. One is the Brilliant, a seedling of the Fameuse. You know Fameuse was for a

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good many generations grown by the French in Canada from seed and not grafted. Now, this Brilliant seems to be a pure seedling of Fameuse, but it is very bright in color and of that most excellent quality of an improved Fameuse. The tree is a better tree in its growth as our northwestern grown seedlings are almost sure to be. I will say, plant that. Then another tree is the Eastman, also a seedling of the Fameuse. That is one of his older seedlings. If Mr. Patten can be criticised for anything, it is his modesty, for not pushing anything that is good. If we didn't have the Wealthy, Eastman would fill the place it has been filling, and I think it would grow in popularity along side of it. It is as large and larger than the Wealthy. It is a striped, very nice appearing apple. The tree bears well and the fruit is well scattered through the tree. Now, those two varieties you should have no hesitancy about planting.

THE PRESIDENT: I think Mr. Bomberger expressed it well when he said that he felt slow to discuss this subject when the veterans talk along these lines.

CAPT. WATROUS: There is one thing I forgot to say. When I stood on the hill side and looked out on the orchards still in bearing and bearing good fruit—the orchard I stood in was planted between 80 and 90 years ago—those seedlings that had been bred from seedlings generation after generation, stood from 80 to 100 years, and just now it was said by topgrafting we could prolong the life from 20 to 40 years, and by and by we will have it from 80 to 100.

THE PRESIDENT: The next is "A Report of the National Apple Show at Spokane," by Prof. S. A. Beach.

THE SPOKANE NATIONAL APPLE SHOW OF 1910.

S. A. BEACH, AMES.

The first National Apple Show was held at Spokane, Washington, in November, 1908. It marked a distinct advance in fruit expositions of this character because of the extent and high degree of excellence of the commercial features of the display. It is safe to say that in this respect it excelled all expositions ever before held whether national or of less than national scope. Prior to this the exhibit of plates of varieties had been the leading feature of the apple display at national expositions and at all other important fairs or exhibitions with the possible exception of some recent local fairs which had been held in the Pacific Northwest. This

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was evident even in so recent a national fruit display as that of the Louisiana Purchase Exposition at St. Louis in 1904, in which little was seen of commercial packages, but the vast area devoted to this fruit was almost wholly taken up with plates of apples which included hundreds of varieties.

In this first Spokane Apple Show on the contrary, the greater part of the space was occupied by apples in commercial packages and in commercial quantities. Undoubtedly the most striking feature of the exhibition was the display of car lots. Even in the contest for the best district display of apples grown anywhere, in which there were no restrictions as to the kind or manner of the exhibit, and the greatest freedom was allowed for the production of artistic effects, the commercial package was made the dominant feature, as it was also in various other displays.

And this is significant. It indicates that the apple growers of the Inland Empire and of the Pacific Coast are keenly alive to the commercial features of their work and are striving to develop the best methods not only of growing, but of handling, storing, and marketing the apple. They are reaching out after the best markets of the world. It is their evident aim to grow fruit free from all imperfections, grade it with care, pack it in the most attractive style and handle it so that it may reach the consumer in prime condition and give satisfaction, to the end that the grower may not only receive good financial returns for the present season's crop, but also that the demand for his fruit may be permanently increased in the best markets.

The management of the Spokane National Apple Shows certainly deserve congratulation and commendation upon the success of their enterprises. They have attracted fruit dealers from various parts of this country and from other lands. They have been of great educational value not only to those who are engaged in fruit growing, but also to those who are interested in learning the best methods of packing and handling the fruit.

The Spokane National Apple Show of 1910 far excelled its first predecessor in the amount of fruit displayed. No less than 18 carloads competed for the $1,000 sweepstakes prize and gold medallion banner, while the district displays from both irrigated and non-irrigated sections, the special exhibits, the ten-box, five-box, and single box competitions, the plate exhibits, the educational exhibits from the Washington Agricultural College and the exhibitions of orchard tools and other apparatus and materials of interest to apple growers combined to make this show undoubtedly the greatest exposition of its kind that has ever been made.

Speaking of the history of the development of this class of apple shows, Editor E. H. Shepard in the October Better Fruit says:

"To the Oregon State Horticultural Society belongs the credit of making the first display of any importance of apples, packed in boxes, which could be called a general display, apples being exhibited from various sections of the State of Oregon. Of course many previous displays had been made in various localities and by various associations, but on plates. The Oregon State Horticultural Society made the first display of boxed fruit in 1904. This display consisted of only a few boxes, but box displays rapidly grew in popularity and magnitude, and during the last three years the

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exhibit has averaged about three hundred boxes. To Hood River Valley, however, belong the credit for making the first display of fruit in boxes, at least of any importance, and certainly the credit for making the first display of apples packed in boxes where a large number of boxes were exhibited. In the year 1902 the display at Hood River was probably about 300 boxes, in 1904 about 600 boxes, in 1906 about 800 boxes, and in 1908 and 1909 about two carloads in each year. But all of these shows were to a certain extent local, and the credit for pulling off the first apple show that was national in significance and large in size belongs to Spokane, Washington, the first National Apple Show being held in that city in 1908; where about ten carloads were placed on exhibition. In 1909 the National Apple Show held at Spokane assumed magnificent proportions, having on display about sixteen carloads. Montana came through in 1909 with a good apple show held at Missoula, and the same year Colorado followed with a National Apple Show held in Denver, consisting of about ten carloads. But this year is the year of all apple shows. The Spokane Apple Show will, as usual, probably be the largest and contain an exhibit of about twenty carloads. California for the first time is pulling off a big apple show at Watsonville, which will contain a large number of carload exhibits. British Columbia is falling in line and will hold the first Canadian Apple Show at Vancouver, and we are advised that space has been engaged for thirteen carloads. All of these shows will not only do all the districts in which they are held an immense amount of good in an educational way, but will be of unlimited benefit to the entire Northwest."

THE PLATE DISPLAYS.

The plate displays included numerous entries and generally speaking the fruit was of superior excellence. They were installed along the south and west walls of the drill hall of the armory. These entries were arranged alphabetically, a most excellent plan which is heartily commended to superintendents of fruit exhibitions everywhere. It avoids the confusion which is caused under the plan of bringing the fruit to the judge and allows the judge to go to the fruit. It prevents the surreptitious using of the same fruit in different entries. It presents to the visitor the opportunity of studying any particular variety by comparing side by side the plates from the different localities represented.

In judging these plate exhibits as to size, overgrown apples were rated down and those which were of most desirable commercial size were rated highest. The judge of course recognized the difference between varieties as to what constitutes a desirable size, as for example between Wolf River and Jonathan. But mere bigness was not allowed to insure an entry first rank.

THE CARLOAD CONTEST.

The most strenuous and exciting contests were in the carload exhibits. Eighteen carloads qualified for the "World's Champion Carload Contest" in which a prize of $1,000 and a championship gold medal banner went to the winner of first honors. $300 and a silver medal banner was offered as second prize. First prizes of $250 and a gold medal banner and second

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prizes of $100 and a silver medal banner were offered for each of the varieties, Esopus Spitzenburg, Jonathan, McIntosh, Rome Beauty, Wagener, Winesap, Yellow Newtown, and for the best mixed carload of any standard winter varieties, having not less than fifty boxes of a variety.

In scoring each carload exhibit the judges as a rule selected at pleasure ten representative boxes from various parts of the exhibit, but of course there was no restriction as to the number which should be scored. The following score card was used:

SCORE CARD FOR BOX EXHIBITS.

Quality	200
Color	200
Size	100
Uniformity	100
Condition	200
Pack	200
Total	1,000
Pack:	
Bulge	40
Height at ends	40
Alignment	40
Compactness	40
Style of pack	40
	200

In the championship contest all other varieties were handicapped in the race because of the quality rating of Esopus Spitzenburg, as is shown by the following statement of the rating for perfection in quality for each variety as adopted by the management of the Apple Show.

QUALITY RATINGS.

	Rating.
Arkansas	6- 7
Arkansas Black	6- 7
Baldwin	6- 7
Ben Davis	4- 5
Cox Orange Pippin	8- 9
Delicious	8- 9
Gravenstein	8- 9
Grimes Golden	9-10
Jonathan	8- 9
McIntosh Red	7- 8
Northern Spy	8- 9
Rhode Island Greening	7- 8
Rome Beauty	6- 7
Spitzenburg	10-
Stayman Winesap	8- 9
Tompkins King	8- 9

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Wagener	7- 8
Wealthy	7- 8
White Pearmain	8- 9
Winter Banana	8- 9
Winesap	8- 9
Wolf River	5- 6
Yellow Bellflower	8- 9
Yellow Newtown	9-10
York Imperial	6- 7

Eighteen exhibits qualified for the championship contest. Each carload consisted of 630 boxes, but for lack of room only 580 were displayed. The Yakima Valley was splendidly represented. Its exhibits included one car each of Winesap and Jonathan from Toppenish, Rome Beauty from North Yakima, Yellow Newtown from Byron, Esopus Spitzenburg and a mixed car of Jonathan, Rome Beauty, Wagener and Winesap from Sunnyside, a mixed carload of Arkansas Black and Winesap from Grandview, Yellow Newtown, Esopus Spitzenburg, and a mixed car of Delicious and White Pearmain from Zillah.

There was also a carload each of Esopus Spitzenburg and Yellow Newtown from Hood River, Oregon; Yellow Newtown from Ashland, Oregon; Rome Beauty from Lake Chelan; Wagener from Spokane Valley, and two carloads of Esopus Spitzenburg from Wenatchee.

The $1,000 Championship prize was awarded to the carload of Esopus Spitzenburg grown by C. H. Sproat, Hood River. This also took first prize, $250, in the Esopus Spitzenburg class. The character of this fruit and the way in which it was graded and packed is indicated by the fact that it scored 997 points out of a possible 1,000. There were three sizes of fruit in this carload, 88s, 96s, and 112s. Mr. Sproat has 40 acres of apples on his Eldorado ranch at Hood River, from which he reports a total yield in 1910 of 17,000 boxes, 6,000 of which were Esopus Spitzenburg. The sweepstake exhibit was taken from two-thirds of an acre. Mrs. Sproat and two daughters sorted the fruit. It was packed by Ralph Ordway and J. Robinson, both of whom entered the packing contest which was held at the show.

The second prize in the sweepstakes entries and also in the Esopus Spitzenburg class was carried off by Hinman and Grandy, Wenatchee, Washington, for their carload of Esopus Spitzenburg which they called "a sample of the 7,000 boxes grown on six acres". The score was 987.9.

GENERAL DISTRICT DISPLAYS.

The General District Displays constituted a very attractive feature of the fruit exhibit, especially from the artistic standpoint. In this class it was intended to bring out the best general collective displays by Clubs, Associations, Unions, Counties or Districts, not by individuals. The prizes offered were gold and silver medallion banners of special design. All of these exhibits were good and many of them ranked high both in the kind and character of fruit shown and in artistic merit. The purpose was to show the apples of chief commercial importance in the districts repre-

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sented and do this in as attractive and interesting a way as possible in the space available. It was recognized also that new or little known varieties which give promise of gaining permanent standing in the commercial orchards of the district need not be excluded. The following score card was used in determining the awards in this class:

SCORE CARD ON GENERAL DISTRICT DISPLAYS.

Selection and effective representation of varieties....	35
Attractiveness	65
(a) General artistic effect.....	25
(b) Accessory decorative material.....	5
(c) Packages or receptacles for holding fruit.	5
(d) Character of fruit:	
(1) Size and form	10
(2) Color	10
(3) Quality and condition.....	10
Total	100

The displays from the irrigated districts were in one class, those from non-irrigated districts in another. They were arranged in booths along the side walls facing the center of the area where the long aisles or avenues of A-shaped frames glowed with the deep red of Winesap and Esopus Spitzenburg or the green and yellow of the Newtown Pippin in carload quantities. Judged from the point of artistic merit only, the Spokane County booth easily ranked first. The front of the booth was divided by four pillars of apples in boxes peeping behind smooth narrow slats. These columns rested upon an oblong base of wood framing broad panels of glass covering black velvet upon which festoons and wreathes of apple blossoms appeared as inlaid work. The paneled ceiling and walls were decorated with figures of baskets made of brown apple twige with the top showing white evaporated apples touched off with the brilliant red of crabapples. Scroll work and other ornamental figures were embossed on the walls in a similar way as also were the words "Spokane County." In some of these figures dark color effects were produced by using quantities of apple seeds. The central wall panel supported a long transverse oval mirror before which translucent apple jellies, marmalades and other by-products were arranged in pleasing color combinations. The leading varieties of apples of the district were displayed on plates and in commercial apple boxes. This exhibit was designed and installed by Mr. and Mrs. Wesels of Spokane whose artistic decorations of the Washington State Building at the Alaska-Yukon Exposition at Seattle in 1909 were greatly admired by all visitors.

In the irrigated class Walla Walla stood first with a score of 95 out of a possible 100, and Cashmere in the Wenatchee Valley second with a score of 90.5. In the non-irrigated class Lyle ranked first with a score of 91 and Spokane County second with a score of 87.

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BOX EXHIBITS.

portunity for the exhibition of a much greater number of varieties than appeared in the carload lots. Here were found, among others, such new-

The box exhibits in the 10 box, 5 box and single box classes gave opcomers as King David and Delicious and such old sorts as Ortley, Northern Spy, Yellow Bellflower, and Tompkins King. It is worthy of mention that the best boxes shown in 1910 at Spokane were Winesap in the 10 box class shown by H. M. Gilbert, North Yakima. These boxes of Winesap scored 799 out of a possible 800 or including the quality ranking for Winesap 969 out of a possible 970. The pack was perfect in bulge, alignment, height at ends, firmness and style and the fruit was perfect in uniformity, size, and color. It could be faulted only in that it showed a few very slight bruises for which it was scored down a point.

THE APPLE PACKING SCHOOL AND CONTEST.

In 1904 Mr. Shepard, the manager of the Hood River Apple Growers' Union, had but eight experienced packers. With these eight men, during the next four years, he developed a crew of eighty men. In 1907, Mr. Huxley, manager of the Hood River Apple Growers' Union, held the first packing school and in 1910, Mr. C. H. Sproat, manager of the Hood River Apple Growers' Union, held in Hood River the most successful packing school ever pulled off up to that time. Two hundred packers were taught the art. The same Mr. Sproat carried off the Champion sweepstake prizes in 1910 at Spokane. This year packing schools were held in the various districts, all teaching the Hood River pack.

From the standpoint of the orchardist there was no more important event in the Spokane Apple Show than the apple packing school and the apple packing contest. Upon the expert packers the fruit growers depend to oversee the packing and shipping of their fruit. Mr. A. P. Bateham of Mosier, Oregon, had charge of the school and contest, assisted by J. M. Carroll also of Mosier. The contest was judged by C. J. Sinsel of Boise, Idaho, assisted by M. L. Dean, State Horticultural Inspector of Montana. Sixty contestants competed for the World's Championship. The interest was at white heat. The contest was held on the stage of the armory, where it could easily be seen by all the audience.

RULES OF THE CONTEST.

In the contest the following rules were to apply:

1. The management to furnish tables, boxes, paper and apples for the contest.

2. Contestants to draw lots for places and numbers.

3. Each contestant to be provided at his stand with six boxes of apples, sizes 150 to the box and larger, so as to afford variety in pack.

4. Apples to be placed on the tables by non-interested persons, aiming to give each contestant a fair average of the whole lot.

5. Apples to be packed diagonally in the standard apple box adopted by the Northwest Fruit Growers' Association.

6. Each contestant to pack four boxes. Time to be called when packer places last box on floor.

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7. To secure perfect or 20 points for speed, the contestant must pack the four boxes within 40 mintes. Every three minutes longer will reduce the score two points, and if not finished within 60 minutes the contestant will be ruled out.

8. The following score card to apply: Speed, 20; uniformity, 10; aligment, 10; bulge, 15; height at ends, 15; firmness, 15; wrapping, 15.

Prizes—First prize, $100 cash and specially designed and engraved medallion watch charm; second prize, $50 cash; third prize, $25 cash.

There were seven tables placed on the stage and four sizes of apples were dumped on them. At the word "Go" each packer started his work with determination to win. Each packer had to line his box with paper and wrap each apple with tissue paper. Each contest had four boxes to fill and as one box was filled and place on the stage another was started. The interested spectators cheered loudly for their special district. Charles Mason of Spokane was awarded first prize as being the Champion apple packer of the world, who made the score 378 out of a possible 400. Time thirty minutes, thirty-three seconds. Prize, $100. The second prize was taken by U. L. Dresbach, Mosier, Oregon, whose score was 370. Time, 26 minutes, 48 seconds. Prize $50. C. L. Green of Wenatchee took third prize with a score of 362. Time, 27 mintes, 24 seconds. This one feature attracted probably the most attention of any one thing at the Apple Show. Apple growers of the Pacific Northwest recognize the real value and merit there is in scientific grading and packing for commercial purposes and for this reason the Packing School has been of untold value to the apple growers and commercial packers. Since the apple grower cannot afford to lose out by leaving his fruit to be packed and boxed by incompetent, slack help, apple packing is fast becoming a business by itself.

The Packing School was held largely to educate men and women to pack the standard commercial pack so that they could act as foremen in their several districts or localities. The diagonal pack was the only pack taught. All carload packs not packed diagonally were cut at least two points on style of pack.

LOOKING AHEAD.

The officials of the Apple Show deserve much credit for the way in which the exposition was managed. The general plan and purpose were carried forward promptly with scarcely a hitch even in the minor details. The Spokane Chamber of Commerce cooperated with the management in giving the exhibitors and other visitors a cordial welcome. The Spokane people are coming to look upon the National Apple Show as a permanent affair. Steps are being taken to provide for it a permanent exhibition building. President Howard Elliott and Secretary and Manager Ren H. Rice have been asked to retain their positions for the 1911 Apple Show. In his opening address President Elliott said that if the apple were used twice as much as it is the cost of living would be lessened and health and comfort greatly increased. He declared that there is no danger of the production exceeding the demand. The difficulty is to grow apples enough. In 1895 with a population of about 75,000,000 the United States produced about 60,000,000, barrels of apples but in 1909, with a population of about 90,00,000 only 22,735,000 barrels of apples were produced.

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MR. WRAGG: You spoke about Washington and Oregon. Does Montana and Idaho cut any figure?

PROF. BEACH: I said there was some there from those states.

MR. WRAGG: What do they grow there?

PROF. BEACH: The McIntosh largely. They grow the Wealthy a great deal and the McIntosh and some Jonathan in Montana. In Idaho they grow the Winesap, Rome Beauty and Jonathan. Different districts have their own varieties. For instance, in the Hood River Districts they show nothing but the Spitzenburg and Yellow Pippin, although they grow other kinds.

MR. PIERCE: Can they grow the Grimes and Baldwin there?

PROF. BEACH: The Baldwin is shown in some districts. Yes, the Grimes is grown to some extent. And the Yellow Bell-Flower and the Ortley, an apple of the Yellow Bell-Flower type, and the White Pearmain. They grow apples with the ideal of distinct colors. The Black Ben Davis was shown some, and the Delicious was shown there in various exhibits. The Delicious was somewhat disappointing this year in its keeping qualities, due perhaps to the season and the fruit being produced on young trees. I expect they will find a better record as the tree grows older.

MR. WRAGG: This season has been very warm and unseasonable out there as well as here.

PROF. BEACH: Yes, a very early season, and I think it would show that feature of the Delicious at its worst.

CAPT. WATROUS: Will you tell us whether there they consider the Black Ben Davis and the Gano as the same?

MR. MURPHY: No, sir; they consider them two distinct varieties, and they are cutting out the Gano and Ben Davis and planting the Black Ben Davis, as being more uniform in color.

PROF. BEACH: The Arkansas Black was in evidence a great deal. The King David was shown to a great extent. The keeping qualities of that also weren't what they expected.

MR. CLEMONS: Is the Banana apple grown to any extent?

PROF. BEACH: Oh, yes, to the extent of the new varieties, and that would be to a limited extent as compared with the Spitzenberg, Winesap and Roman Beauty. It is an apple that has to be handled with gloves; it shows bruises easily. When grown and of large size, it shows something of the same defect as the Delicious this year did; that is, it doesn't keep as well.

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MR. BOMBERGER: Prof. Beach spoke about the McIntosh in Montana. I would like to ask Mr. Harrington about the behavior of the McIntosh?

MR. HARRINGTON: I have trees of it, but not in bearing.

MR. GARRETT: I might answer in regard to the McIntosh in this locality. I don't know of any variety that is as subject to scab as the McIntosh.

PROF. BEACH: If any of you people are interested in an apple of that type, it would be well for you to put on trial and watch the Hutchins Red grown at Council Bluffs in the Hess Orchard. I think it is an apple that should be better known.

THE PRESIDENT: I understand the Committee on Awards is ready to report.

REPORTS OF COMMITTEE ON AWARDS.

NORTHERN DISTRICTS.

C. H. True, 16 varieties	$ 9.00
Earl Ferris, 27 varieties	13.00
C. H. True, Sweepstakes	7.00
Earl Ferris, Sweepstakes	8.00

J. W. MURPHY, *Judge.*

CENTRAL DISTRICT.

F. O. Harrington, 12 varieties	$12.00
B. Stuart, 15 varieties	11.25
Chas. O. Garrett, 65 varieties	48.75
Wm. Langham, 3 plates grapes	2.50
A. B. Dennis, plates nuts	15.00
Chas. O. Garrett, 3 box	4.00
Chas. O. Garrett, Sweepstakes	12.00

E. E. LITTLE, *Judge.*

SOUTHERN DISTRICT.

F. P. Spencer, 1 variety	$ .60
Minnie Avery, 1 variety	.80
C. E. Mincer, 32 varieties	16.80
J. M. Bechtel, 21 varieties	12.00
Wm. Goy, 7 varieties	4.00
C. E. Mincer, 3 boxes	5.00
C. E. Mincer, Sweepstakes	5.00

F. O. HARRINGTON, *Judge.*

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THURSDAY EVENING SESSION.

ELECTION OF OFFICERS.

The following officers were elected:

President, William Langham, of Cedar Rapids.

Vice President, M. J. Graham, of Adel.

Secretary, Wesley Greene, of Davenport.

Treasurer, F. O. Harrington, Williamsburg.

For Director of the First District, C. G. Blodgett, Mt. Pleasant.

For Director of the Third District, Geo. H. Van Houten, Lenox.

For Director of the Fifth District, Millard Harrington, Williamsburg.

For Director of the Seventh District, W. B. Chapman, Correctionville.

For Director of the Ninth District, W. C. Haviland, Fort Dodge.

For Director of the Eleventh District, C. F. Gardner, Osage.

THE PRESIDENT: If there are no further committee reports or unfinished business, we will proceed with the program.

MR. VAN HOUTEN: Several members during the session have inquired of me concerning the button of this society. The committee reported a year ago.

I now offer a motion that the Executive Committee be authorized to procure buttons and sell them to the members of the society at such price as may be fixed.

The motion was duly seconded and carried.

MR. WRAGG: We have a man with us tonight, the only man I know from Western Montana. I am referring to Mr. Arthur Huntington. I move you that he be made an honorary member of this society.

The motion was duly seconded and carried.

MR. HUNTINGTON: I wish to thank the society for this honor. I hope I may derive some benefit from it other than representing the state for my company. I want to say, so far as Horticulture is concerned, the best trees we got in Montana last year, came from Iowa nurseries and were Iowa varieties. The apples developed in Iowa seem to do equally well in the Northwest; in fact some seem to do better than they do here? I thank you.

At this time, Secretary Greene read a letter from John Craig,

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secretary of the American Pomological Society, inviting the society to send a delegate to the meeting of that society to be held in Tampa, Florida, February 9-10-11, 1911.

Upon motion duly made, seconded and carried, Wesley Greene was elected as the delegate to that convention.

APPLE GROWING IN IOWA AS COMPARED WITH APPLE GROWING IN THE WESTERN STATES.

J. W. MURPHY, GLENWOOD.

I suppose the subject was given to me because the secretary knew that I was going to Spokane as one of the judges at the National Apple Show there, which was undoubtedly the greatest show ever held any place.

Forty-nine car loads or about thirty-one thousand boxes of the finest apples Old Mother Earth could produce were on exhibition.

Now I will try to tell why they grow such apples and why we cannot or do not. They have the climate, the soil, the rain in the winter and the sunshine in the summer. They prune and cultivate annually, they spray at least once in the winter with lime and sulphur, and four or five times during the growing season, with either lime and sulphur or arsenate of lead. As they have scarcely any rain in summer they get the full benefit of the spray. The continued days of sunshine gives the high and beautiful color which makes them the observed of all observers.

The apples are of excellent flavor and endless variety. There is no frost after blooming season that damages the crop, therefore the crop is a sure thing as far as frost is concerned. Then too, they get better prices than we do here, when we have a crop. The market in Spokane ranges from $1.25 to $4.00 per box. The Ben Davis is the cheapest, selling for $1.25 per box; other varieties are higher, ranging up to the Delicious which are $4.00 per box.

One farmer told me that he had missed but one peach crop in sixteen years, and in twenty years in apples had not missed a single crop.

It is common for trees that have been set out for five years to bear from three to seven boxes of first class apples, while trees of twenty years standing bring as high as eighty-five boxes to the tree.

The high prices paid for orchards in bearing will bear out all of these statements, as they are selling from twelve hundred to three thousand dollars per acre without any other improvements.

The cultivated soil never washes as the rain fall is so gentle and light that the plowed soil takes in the water as fast as it falls.

They have no winds hard enough to shake off any kind of fruit. Thunder and lightning is almost an unknown quanity, and while there is some hail it comes so gently and without wind that it doesn't do any damage that will spoil a crop.

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The apples are thinned by picking them off so as not to leave two apples touch, and still the limbs have to be propped to prevent breaking. The success of the west is attributable largely to the fact that the man who grows the fruit doesn't try to do all kinds of farming in connection with his fruit growing. The farmer who grows grain and grass does not try to grow fruit, hence both are successful.

In Iowa we find the conditions entirely different from the west. It is true our soil is adapted to the growing of fruit trees, and usually they do as well here as in many parts of the country where fruit is raised; but we will have to change our plans for the future to make a success. We must put out in our orchards heaters or fire pots to counteract the frosts which come just in time to nip our fondest hopes in the bud. We must prune once a year and spray at least five times a year during the season. We must cultivate part of the time and seed back to clover. My idea would be about two years of thorough cultivation and then three or four years in clover. If the soil is good and doesn't need a fertilizer it would be all right to mow the hay and take it off the ground; but do not let any kind of stock run in the orchard. With all of these ideas complied with, we still have the hard winds in the fall, or the hail storm which comes unexpectedly and ruins our crop when it is almost ready to harvest. Such was the result last fall when thousands of bushels of apples were frozen on the trees, before the picking season was half over. Of course this happens only once in a long time, but it helps to discourage the grower and keeps him from spending his time and hard earned cash which he has accumulated by raising corn and hogs on the same farm where he is trying to grow apples without any effort or extra care for the orchard. But in conclusion I want to say that I believe with the same care and attention they give their orchards in the west we could raise many crops that would astonish the growers of the whole apple kingdom, both in size, attractiveness and flavor. This fact was demonstrated last January at the great Colorado Apple Show at Denver, when the Colorado apple growers had to take off their hats to Iowa's great exhibit, and had to give up many of their largest prizes which they had expected to keep at home.

CARE OF ORCHARDS.

ELMER M. REEVES, WAVERLY.

It is a well known fact that the orchards of Iowa do not receive the intelligent care they deserve or that would repay for the trouble and make them a profitable part of the general farm operations. Most owners of land in this state plant apples trees. Many of them plant because some enterprising and persuasive agent sells and delivers the trees to them and not because they plan an orchard as a regular part of the business. Others plant a few trees because it is a habit and they feel it to be a duty each spring to fill in the vacant places in the plot of ground they

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call an orchard. Some of us know how to give good care to our trees but have not lived up to our knowledge and opportunities in the raising of our trees.

When I was a small boy I remember the pleasure it was to visit some of the orchards of several acres in our county. There were others like them all over the state. They were of the old eastern varieties: Baldwin, Newton, Northern Spy, Spitzenburg and other of the really good sorts. These orchards lived to a good age, bore abundantly and were a source of great profit to the owners as long as cared for according to the rules then followed. Since that time more dependance has been placed on hardiness of varieties than on the care of good ones and we have received less from our plantings than we would to have stayed by the old list, tender though they were, than to plant all the conglomerate mess that has been sent over the country. I say this with all respect to the good intentions and energy of those who were responsible for this condition. Hard winters, neglect and other causes took these orchards years ago and there have been few to take their places in supplying the public. Our apples now must come from south where they will not keep and Ben Davis is a fall apple, from the east where there are ten larvæ to each specimen and all but the top layer are apt to be culls, or from the west where the difficulties of growing fruit are met and overcome and growing apples is a business proposition.

Few Iowa growers have figured on a business basis. Planters demand too many varieties and many of them not suited to the needs of our markets. The one hundred and fifty varieties shown at the State Fair and other places may be interesting but most of them should not be grown. They are of value as curosities or examples of what we should not plant rather than valuable as commercial sorts. A commercial sort should not only be prolific, but have good quality, such as is demanded by discriminating customers. The same rules should apply to those grown for home use so the list could be cut down to a very few varieties. In one of the main apple growing valleys of the west many varieties have been tried but from now on the plantings will be mainly of but two varieties, all the others not making one per cent. of the plantings now proposed. This makes the crop of commercial value, the few of other sorts selling at a much lower price than the standard which are the ones doing better there than in any other spot on earth.

It has been stated and I believe fairly proven that Southern Iowa and especially the western part will grow the Jonathan the best of any place. Last year at the Council Bluffs fruit show, with the west and east competing, and with a plate from Colorado selected by looking over five hundred boxes of the best Jonathans to be found, Iowa Jonathans took first and second premiums on that variety. Why not make this a standard in the parts of the state where it will thrive. This principle followed out will give us a list that can be relied on for profitable crops. It is quite different with the fruit from an orchard of many varieties. Small trees, the younger the better, but of first class for their age, will make the best orchards. Plant these in well drained ground that is in a good

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state of cultivation. The rule with those old time orchards was to cultivate well from early spring to July, keeping the ground bare and free from all crops. Then a clover crop was grown. Usually this was simply the crop nature supplied and which our Iowa soil grows with such luxuriance on the least provocation. With any crop raised in the orchard the trees usually suffer thereby. This cover crop should be left until spring and then plowed under and the same treatment continued as long as the orchard is expected to keep in good health. Most of us have to confess that we have allowed our orchards to become seeded to grass and we have tried to believe that this was the proper treatment, but even in the best apple regions of the west an orchard shows signs of failure as soon as the ground is seeded to grass and if this condition is continued the trees rapidly go to destruction. It is the same with us, but we have laid much of this to climate instead of admitting our own sins in the matter.

Any bruise on trunk or roots of a tree is a serious matter and should be carefully avoided and in cultivating and all operations in the orchard this should be borne in mind.

Pruning should be done as the buds start where limbs are not wanted and so avoid the cutting of branches later and at all times keep the heads open and without cross limbs. If triming must be done, early June is the right time for it. Protect the trunks while young with wood or other good covers each winter and avoid planting the orchard where windbreaks or other obstructions will cause snowdrifts to pile among the trees to break them as the snow melts and to allow rabbits to damage the tops.

In case trees make a rapid growth the twigs should be shortened each year. This is especially important with the pear and with trees that have not fully ripened their growth.

Cross pollination is fully accomplished in small orchards without special planting and in large plantings it is fully provided for if two rows of a variety are planted together and this is convenient in the work of spraying and gathering of fruit.

Spraying should be started the year the trees are planted and followed systematically each year whether there is a crop or not. This should aim at fungus growths and so keeping the trees healthy, as much as to kill insects; although the insect feature of the work should not be neglected. It is a harder matter in Iowa to have fruit free from coddling moth than in some of the western fruit sections where the cool nights almost or quite prevent the flying of the moths. Besides, our state is so badly infested that it requires much skill and care to grow perfect fruit. Plum trees in an apple orchard are a source of trouble as they are sure to breed curculio and these are harder to control than the insects that feed by biting their food. If possible plant the plums at a distance from the apple orchard.

Any tree that overloads with fruit should have attention and while the fruit is quite small and not be left to grow a large number of inferior specimens. The fruit on a tree, properly thinned will make more bushels than if left with an overload and of a superior quality and therefore bet-

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ter for use and worth more in the market. This applies to all kinds of fruit with perhaps equal truth.

I have no patience with a discussion as to whether it is best to seed an orchard to grass. When results are studied there is but one side to this question and while trees will do well for a time in our rich Iowa soil if the same ground is required to grow some other crop, a good crop of good fruit can only be matured by giving clean culture or by some method that will insure to the trees the strength of the soil. If it were not for the needed winter protection it would be best to continue the clean culture until fall. The injury of winter might often be avoided by a thorough wetting of the soil before freezing time. This is done in many of the western orchard sections, but we hope for rain and when it fails we are not prepared to supply the needed moisture and the trees suffer and we lay it to providence. There are but few seasons in Iowa when irrigation would not pay during some part of the year. Why not supply it? Are Iowa fruit growers to continue the careless methods of the past and buy their fruit from other states. Why not live up to our opportunities and make our Iowa a fruit producing state. No one has ever grown good fruit in this state and failed to profit from it if a fair degree of intelligence was used in the marketing.

LEGISLATION OF FUNGUS DISEASES OF PLANTS.

L. H. PAMMEL. AMES.

Kuhn's work on Die Krankheiten der Kulturgewachse, published in 1858 in Berlin, opened up the way for a thorough study of the diseases of plants. This was later supplemented by numerous treatises, mostly mycological, by such men as DeBary, Berkley, Wolf, Brefeld, Sorauer, Hartig, Frank, Comes, Prillieux, Tubeuf, Marshall Ward, Farlow, Thaxter, Bessey, Burrill, Erwin F. Smith, Arthur, Atkinson, Galloway, Lamson-Scribner, Balley, and the more recent treatises by Selby "Hand-book of the Diseases of Plants," Duggar, "Fungus Diseases of Plants," and Stevens, "Diseases of Economic Plants," have opened the way for a study of the relations of diseases of plants to the cultivated crops.

One of the most important epochs in connection with these studies of the diseases of plants has been the matter of the control of fungus diseases. The invasion of several American fungus diseases in Europe well nigh threatened the grape industry. The important discovery made by Millardet in France in 1882 opened up the way for a rational treatment of these diseases and thus checked the rapid spread of a fungus that threatened the very life of France. In the year 1877 or '78, the Downy Mildew invaded European countries just as at a somewhat later date the holloyhock rust invaded Europe, threatening the cultivation of this plant. At a somewhat later date this appeared in the United States, being especially severe upon the Pacific coast.

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The Asparagus Rust is another illustration of a European parasite spreading across the country and doing an enormous amount of damage to the asparagus plant. Recently Dr. Salmon has given a note of warning on the introduction of the mildew of gooseberry into various European countries. It is of the utmost importance that we should take heed of the recent introduction of several injurious parasites into North America.

Recently there was introduced upon the Island of Newfoundland a a serious potato disease which our Canadian botanist, Prof. Gussow, calls the Potato Canker (*Chrysophlyctis endobiotica.*) Very little is known of the origin of the disease, but at any rate, during the past thirteen years it has spread rapidly in European countries. It was first described for Hungary in 1896 and in 1901 it was found in England. Unfortunately, this disease is not noticeable until the potato crop is harvested, and it is liable to contaminate the ground.

Another most interesting case is the Blister disease of the white pine. Until a few years ago this fungus was only known to be serious in certain parts of Europe. The cluster cup stage of this true rust occurs upon the white pine, while the uredo, the second stage, and the teleuto, the third stage, occur upon the currant. These stages, however, are not nearly so severe as the fungus upon the white pine. Now it is of interest to note that the white pine is a tree native to North America, but so far as I know, this fungus has never been found upon the native American white pine. On the other hand, it is known that this fungus occurs upon one of the European pines, *Pinus cembra*, and possibly may have been transferred from some Himalayan species to the European pine. In 1906 Mr. F. C. Stewart, the botanist of the Geneva, New York, Agricultural Experiment Station, reported on the occurance of this fungus near Geneva, New York. In 1909 the cluster cup stage of this fungus was found in a nursery of three year old white pine seedlings reported from Germany, which led to an investigation of the distribution of this fungus in the United States. Mr. G. G. Atwood of the Department of Agriculture of the State of New York has given us a somewhat extended account of this fungus. Mr. Perly Spaulding has likewise contributed a note on the spread of the fungus in this country. Last summer Prof. Haven Metcalf, Forest Pathologist of the United States Department of Agriculture, in a lecture at Ames, on the subject of "Plant Diseases and Legislation" stated that the fungus was reported from 131 places in Europe, and imported into 132 places in America, all but three lots imported from the same nursery.

The point arises—what can we do to prevent the spread of such fungi? One nursery in this state having this fungus may be responsible for scattering the disease all over the state.

In many parts of the state and in some nurseries the Crown Gall is a common trouble. The question arises whether this Crown Gall shall be considered a contagious disease and whether our inspection shall include this parasite. After having observed the splendid results obtained by Dr. Erwin F. Smith with the organism which he has isolated, it seems to me that there should no longer be a doubt that this disease should be legislated against.

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The purpose of this paper is to call your attention to the necessity of having the needed legislation to protect the state from foreign parasites that may be introduced at any time. It seems to me, moreover, that you have had good and efficient inspection so far as the insects are concerned, so that what we now want is the cooperation of a plant pathologist in connection with this plant inspection work. A number of states, notably Maryland, are pursuing this policy and I trust that the members of this society will further a plan for such inspection.

EVERGREENS FOR THE HOME.

C. O. GARRETT, ADELPHI.

In glancing over our program, I see I have the only number where Evergreens are mentioned.

Friends, this is a favorite subject with me. Let us not neglect this one of the greatest factors in the ornamentation of our homes, country and suburban especially.

Go with me through the lands of our state and notice the utter barrenness of so many otherwise beautiful homes. Where ornamentation (especially in winter) is impossible without the judicious planting of Evergreens thereon.

Let me call your attention to an ordinary farm home such as we find in a great majority of cases throughout this state. Usually we find some box-elders, maple or cottonwood planted here and there near the house, while the more thoughtful and provident home builder has planted a so-called windbreak and shelter belt of maple and willow a few rods away from the buildings.

These surroundings when the high winds blow and storms prevail utterly fail to serve the purpose for which they were planted. Let us turn to a sheltered home such as all have seen and can now call to mind, and note conditions. The thoughtful home builder has provided shelter in the time of storm, by carefully laying out his grounds and planting evergreens, such as thrive best in his particular locality. They need not be extensive or expensive. I now call to mind the case of a neighbor who planted fifty Scotch pine at a cost of $4 00, which, when planted in two rows alternating or breaking joints soon made an almost solid wall twenty to twenty-five feet high, now adding safely $200.00 invalue to this home. In fact this place recently sold for $150.00 per acre and the purchaser had this splendid windbreak in mind when he made this investment for a home.

Of course the more extensive planting of suitable varieties of Evergreens is advisable. The planting of two rows of evergreens at a reasonable distance from the home and buildings, the exposed row being white or Austrian Pine and the Inner or less exposed Arbor Vitae or Norway Spruce.

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I now have in mind an evergreen windbreak such as this planted about thirty years. White pine on the exposed side and Arbor Vitae within. Look at the tall row at the front arrayed to meet the winter winds and check them in their fury. While the Arbor Vitae inside make an impenetrable wall through which no wind can blow.

Here let me say that the Austrian Pine seems to me to be one of our best and most neglected evergreens. Who ever saw a poor specimen, if given room to develop, or ever saw one shrink from the piercing wind and cold, or show deterioration by old age. We have here in this vicinity specimens of this sturdy variety 35 to 40 years planted that look as if they would endure to the end of time.

Their hardiness and ruggedness especially appeal to me. The selection and planting of evergreens for the adornment of home grounds is a large subject of itself. We have on our premises the following all beautiful typical specimens of their respective varieties: Black Hills Spruce, Englemani Spruce, Balsam Fir and Pyramidalis, also an ornamental row of Pyramidalis 25 rods long that has the appearance of each specimen being sheared and trained to some particular symetrical form.

The point that appeals most to me about evergreens for the home, (and certainly should appeal to every home maker) is this: when all leaf plants and trees are bare, all deciduous growth is naked and desolate, then we turn to the evergreen in its magnificence, standing out in sturdiness, serving a double purpose. That is, ornament and shelter. Ornamental when all else in nature is dormant; likewise shelter when we really need shelter most.

This brief paper cannot yet serve purpose intended unless I turn aside to the point of urging the nurserymen who grow evergreens to take more care and precaution in the handling and shipping of them, care in digging, avoiding the deadly exposure to sun and wind, guarantee safe delivery in good condition and make that *delivery good.*

Many a planter after the most painstaking care has utterly failed to secure a stand, not through his neglect, but that of the growers who had failed to do their part well.

Finally, friends of our Society, let us all urge and advocate the planting of evergreens for our Iowa homes. If the agricultural and horticultural press of the middle west would take this matter up earnestly, urging people who own homes and can find room for them to plant evergreens, and thereby we will be real benefactors to our state and beautify the homes of Iowa for the betterment of our posterity and future generation.

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HARDY PERENNIAL PLANTS FOR IOWA.

M. J. WRAGG, DES MOINES.

As a rule our people have not awakened to the valuable uses to which our hardy perennial plants can be used. As the years come they will be more plentifully used, as the border demand is commencing to become greater in this line. As parks are developed and as our home-makers become educated to the beautifying of their homes, there is no plant that will take the place of these. No border can be made complete, nor the finishing touches to an ornamental ground without the use of some of our best perennial plants. They are grown in all colors and varieties and their uses are very extensive.

In this paper we only intend to give a list of those varieties that we have been growing and flowering for years and know them to be reasonably hardy here.

ACHILLEA. *A Millefolium roseum.* Fern-like foliage, low-growing, 15 to 18 inches' high. Blooms in dense heads of bright rose-colored flowers in August.

ANEMONE. (Windflower). One of the most showy of all autumn-blooming herbaceous plants. Blooms freely from August till cut down by frost. In light, somewhat moist, rich soil, the plants make a beautiful, hardy border or bed. A slight covering of leaves or straw is sufficient protection in most severe winters. *A. Japonica*, var. *alba.* Pure white, with yellow centers; large, single, long-stemmed flowers. Plant grows two to three feet high and blooms from September until frost. Fine for cutting. Queen Charlotte. Large, semi-double flowers of silvery pink.

AQUILEGIA. (Columbine). These are plants of elegant habit, distinct in foliage and flowers. The latter form a showy crown well above the clear-cut leaves. All the species like partially shaded, well-drained soil. One of the best plants for rockwork, or growing under trees.

ASCLEPIAS. *A. tuberosa.* (Milkweed, Silkweed, etc.). A handsome field plant two or three feet high, with many showy cymes of intense orange flowers in mid-summer. The seed-pods are interesting.

Aster. (Michaelmas Daisies). The hardy, perennial Asters have become very popular, as they grow without the slightest care and brighten up the garden when other flowers have gone.

ASTILBE. (Spirea). *A. Japonica.* A handsome plant fifteen to eighteen inches high, with small, pure white flowers in large, feathery panicles. It is extensively used for forcing in winter. Blooms in the garden in June.

BOCCONIA. *A. cordata.* (Plume Poppy). Stately, growing from six to eight feet high, with large foliage and long spikes of white flowers in August.

CAMPANULA. *C. Carpatica.* (Carpathian Harebell). A very pretty species, growing in compact tufts, not exceeding eight inches in height; flowers clear blue, one inch in diameter; from June to August. *C. alba.* A white-flowering form of the former. Blooms continually throughout the summer. *C. Medium.* The well-known CANTERBURY BELLS. Blooms

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in July; height two to three feet. Handsome spikes of bell-shaped flowers, making a gorgeous show in the garden. In three colors—blue, white and rose.

COREOPSIS. *C. grandiflora.* A beautiful, hardy border plant that grows fifteen to eighteen inches high and produces its bright golden yellow flowers in great profusion the entire season. Beautiful masses and a favorite for cutting.

DELPHINIUM (Larkspur). *D. Barlowi.* A new sort with large, very deep blue flowers. *D. Belladonna.* A magnificent new Larkspur, surpassing every other variety in delicacy of color, and freedom and continuance of bloom. Flowers are an exquisite shade of turquois-blue, commencing to show in June and continuing until frosts. *D. Chinense.* Dwarf growing, with fine feathery foliage, and an abundant display of rich blue flowers. *D. Alba.* Flowers pure white. *D. formosum.* A strong, robust perennial two to three feet high; flowers in abundance; dark blue with white center. June and July. If the flower-stalks are cut down immediately after the first blooming, another crop of flowers can be obtained in autumn. *D. coelestium.* Pale. delicate blue.

DESMODIUM. *D. penduliflorum* (Lespedeza Sieboldi). A beautiful Japanese perennial, with clover-like foliage, and long, pendulous racemes of rosy purple flowers. The stems are four feet long, and in early autumn are literally loaded with flowers. Very hardy and showy, and a fine plant for growing in front of shrubbery.

DIANTHUS. (Pink). Valuable border plants, hardy everywhere; blooming freely in May and June. All have a rich clove fragrance. Hardy Garden Pinks: Gertrude, white, with maroon markings. Her majesty, very large, purest white.

DICENTRA. (Bleeding Heart). *D. spectabilis.* A hardy perennial with heart-shaped, rose-colored flowers in drooping spikes. One of the best border plants; perfectly hardy and easily cultivated; two feet high. Flowers in April and May.

DICTAMNUS (Gas Plant). *D. fraxinella.* A very showy plant, forming a bush about 2½ feet in height, having fragrant foliage and curiously shaped flowers. *D. alba.* White flowers in long spikes. *D. rubra.* Red flowers.

FUNKIA (Day Lily). The Funkias all make handsome, showy plants with beautiful, broad ovate leaves, and large, lily-like, fragrant flowers, in large clusters. They like to grow in moist, shaded places and form clumps twelve to twenty inches high. In bloom from July to September. *F. undulata variegata.* Graceful, with narrow leaves having a fluted white edge. *F. subcordata.* A fine old species, with large, pure white flowers and wide circles of broad leaves. Very popular for porch borders, or to screen foundation walls.

GAILLARDIA. (Blanket Flower). *G. grandiflora.* A showy plant with dense leaves and flower-stems two feet high, producing daisy-like blossoms two to three inches across, of gorgeous colors. The center is dark red-brown, while the petals are orange, crimson and red, shaded into rings of color, thus hinging the petals into three somewhat distinct sections.

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Delights in a rather poor, light soil, and blooms in the most wonderful profusion from June to November.

GYPSOPHILA. *G. paniculata* (Baby's Breath). Two to three feet in height and most graceful in effect, with mist-like white flowers that are popular for cutting, as they give an air of grace and harmony to any arrangement. Often used inside driveway circles. Blooms July to September.

HEMEROCALLIS. *H. Dumortieri.* Very dwarf and compact, 1½ to 2 ft. high, producing an endless number of large, lily-like blossoms of a bright orange-color in June. The smallest plant will bloom the first year. *H. flava.* (Lemon Lily). A pretty plant with long narrow leaves and flower-stalks two to three feet high. These are crowned in June by delightfully fragrant, beautiful, lemon-colored flowers, three to four inches in diameter. A very popular variety. *H. Kwanso* fl. pl. (Double Orange Lily). Large, double, copper-colored flowers; in bloom all summer. An excellent plant for the hardy border—one that grows 1½ to 2 feet high, and blooms well in almost any situation. *H. Thunbergi.* Beautiful lemon-yellow, fragrant flowers from July to September. Grows 1½ to 2 feet high, and bears eight to ten flowers on each stalk.

HIBISCUS (Mallow) *H. Moscheutos* (Swamp Root Mallow). Large, purplish pink flowers. Grows four to five feet high. and blooms in August and September. One of the most gorgeous of perennials, and attracts great attention wherever grown. *Crimson Eye.* Immense flowers of purest white, with large centers of velvety crimson.

IRIS. (Fleur-de-Lis) GERMANICA (German Iris). Familiar and well-beloved flowers of spring. The purity of their beauty, and their haunting fragrance are decidedly refreshing. They are perfectly hardy, thrive anywnere, grow and bloom luxuriantly; particularly if plentifully supplied with water, or if planted in moist situations, as on banks of ponds, etc. Plants well established produce from 50 to 100 spikes of b'oom.

There are over fifty varieties of the German Iris that are perfectly adapted to Iowa planting. They have been so improved in late years that they have become one of the most gorgeous flowers as far as color effect is concerned that we know of. *I. Kaempferi.* (Japan Iris). The Japanese Iris should be planted in a somewhat cool, moist situation, and in rich soil. Its flowers, in late June and July, are quite distinct from those of all the varieties, and will compare favorably with some of the exotic orchids.

LOBELIA. *L. cardinalis.* (Cardinal Flower). Erect perennial, two to four feet high, with intense cardinal-red flowers from May to September, borne in a loose raceme. One of the most showy and brilliant flowers of the garden.

LYCHNIS (Lamp Flower). *L. Chalcedonica.* One of the most showy border plants, two to three feet tall, throwing out large heads of brilliant vermillion-scarlet flowers in June.

MONARDA (Mint). *M. didyma* (Oswego Tea). One of the showiest and most brilliant of our perennials, with large heads of fragrant scarlet flowers. Will grow 1¼ to 2½ feet high, and flourish in any soil. Is a beautiful adornment to the flower-garden.

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PAPAVER (Poppy). *P. nudicaule* (Iceland Poppy). A beautiful class of hardy Poppies, forming tufts of fern-like foliage.

PAEONIA. The Peony stands at the head of all hardy herbaceous flowers, for they are grown at the present time in so many varieties and colors that in an article like this we would not care to give them, but there are about thirty of the most distinct varieties that we think are most gorgeous, but we do not have command of language at hand to even attempt the description of them.

That Peonies are as fine and effective in their way as rhododendrons or roses is now very generally recognized. They are hardier and more easily cultivated than either of their rivals, and are being used in the same way for bold displays of color. Their flowers are very lasting; some of them are finely finished and exquisitely colored. The Peony societies are doing good work in extending the culture of this grand old flower. Plant in deep, rich, well-prepared soil, covering the buds but an inch or two. Do not expect too much of them the first year. They are a little slow in establishing themselves.

PARDANTHUS (Blackberry Lily). *P. Chinensis.* Blooms from June to September, with lily-like blossoms of orange-red spotted brown. Large ornamental seeds, resembling blackberries, follow the flowers.

PENTSTEMON. (Beard Tongue). The Pentstemons bloom persistently through the summer, and are found very useful for cut-flowers, or for color masses in the garden. Easily grown in any garden soil. *P. barbatus*, var *Torreyi.* A well-known brilliant-flowered form; scarlet; almost beardless.

PHLOX. No class of hardy plants is more desirable than the Perennial Phloxes. They will thrive in any position and can be used to advantage in the hardy border, in large groups on the lawn, or planted in front of belts of shrubbery, where they will be a mass of bloom the entire season.

All the Phloxes, with the exception of the dwarf varieties, are admirably adapted to cutting. Every stem is topped by a heavy pyramidal flower-cluster. If a few of these are pinched back, or even if the flowers are removed as soon as they have faded, good, smaller spikes will succeed them until frost. As a perennial bloomer there is no flower that equals the Phlox and their variety of color is legion. With the many improved varieties that have been brought out, in the next ten years our flower-lovers can have flowers of the most gorgeous hues, up to the very latest date possible in the fall.

PLATYCODON (Chinese Bell-Flower). *P. grandiflorum.* A valuable perennial, forming a dense branching bush of upright habit, one to two feet high, with neat foliage. From the middle of July until late September it bears a constant succession of handsome, large, bell-shaped, deep blue flowers. Succeeds well in any ordinary soil. *P. album.* In all respects the same, except in color of flowers, which are white. *Mariesi.* A form with very blue foliage and blue or lavender flowers on stout stems about a foot high. Plant is very compact and a valuable addition to the border.

PYRETHRUM (Daisy Feverfew). The Pyrethrums are handsome composite flowers, with finely dissected foliage, growing one to two feet high and blooming all summer.

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SALVIA (Meadow Sage). *S. azurea grandiflora.* A handsome species of the well-known Sage, with a profusion of sky-blue flowers in August and September. Plant grows two to three feet high.

SAXIFRAGE (Rockfoil). Handsome foliage plants of low, spreading growth, most at home as edgings or in rockeries. Flowers are borne in graceful panicles, and are very pretty in spring.

SCABIOSA. *S. Gausasica.* (Mourning Bride). A beautiful border plant, about eighteen inches high, with long-stemmed, lilac-blue flowers, that are fine for cutting. The finest species in its genus. Blooms from June until October.

STATICE. (Sea Lavender). *S. Latifolia* (Sea Pink). A native of Russia and exceedingly hardy. The plant grows about a foot high, has broad, luxuriant foliage and slightly recurved spikes of lilac flowers in midsummer.

STOKIA. *S. cyanea.* A grand, large-flowered, hardy perennial, growing eighteen to twenty-four inches high, and covered with centaurea-like flowers of a beautiful lavender-blue shade, often four to five inches across. Of easiest possible culture, flourishing wherever given an open sunny exposure. As a single specimen plant, used in mixed borders or in large masses by itself, it is equally valuable, and, by its use, some very effective plantings may be worked out. Blooms from July to October continually.

TRADESCANTIA (Spiderwort). Bright and pretty plants about two feet tall, with richly green foliage and clustered blossoms an inch wide; in bloom all summer. *T. Virginica.* Deep violet-blue. *T. alba.* White.

YUCCA. (*Adam's Needle*) *Y. filamentosa.* An evergreen, with large, dense, circular tufts of long, stiff, sharp-pointed leaves, from the center of which rise the flower-spikes in June. They are three to four feet high, stout, branching near the top, and supporting hundreds of large, drooping, waxen-like flowers, that remain perfect for several weeks. The effect of a good clump in full bloom is striking and has much the effect of statuary. Most effective planted in front of shrubbery; its white flowers contrast with the dark background.

PRESERVING ODDS AND ENDS.

MRS. ADA E. PELLETT, ATLANTIC.

Some housewives are asking if home canning pays, in these days when fruit is priced so high? If one buys choice fruit at the usual price, considers all the expense and work of canning, I am inclined to think that it does not pay to preserve on a very extensive scale. It is a different matter where the fruit used would otherwise be a waste product. When living on a farm where some attention is given to fruit growing, there is no reason why we should not have a variety of fruit at all seasons, served in an appetizing manner.

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In addition to the choicer fruits, summer and fall apples, culls of winter apples, pieplant, elderberries, crab apples, and even wild plums, may be canned in such a way as to tempt the most delicate appetite. Some of the sour varieties of summer apples like the Dutchess, are a little hard to keep, but such apples as Red June, Yellow Transparent, Sweet Apples, and Jonathan are easily kept. These are better not to be cooked to a mush, but must be canned at the boiling point. Remove all air bubbles before sealing.

Pie plant can be canned without cooking and makes splendid winter pies. Cut and peel the stalks, wash in hot water, pack into hot sterilized jars, cover with boiling water and seal. Gooseberries may also be kept in this way.

Then there are Elderberries which may be saved for pies until the pumpkins are gone. This little berry may either be cooked alone or mixed with pieplant, nothing being added except a little water at the beginning. When making Elderberry pies, I always add three tablespoonfuls of vinegar for each pie, as this berry is lacking in natural acid.

Now for the wild plums. We cook them in strong soda water until the skins begin to burst. This softens them and removes the bitter taste. Then drain off all the soda water, add sugar and more clear water, cook slowly for half an hour and the result is a finely flavored sauce.

Our home canned sweet corn, we consider superior to any factory brand on the market. The recipe is nine cups of corn to one of sugar and one half cup of salt. Add a little water, cook well, and be sure to seal at the boiling point. This must be freshened a little before using. For vareity try mixing with tomatoes. The acid of the tomatoes keeps the mixture without the addition of sugar or salt. Only enough salt need be added to suit the taste.

If you would have your canned fruit keep perfectly; sterilize the jars thoroughly with boiling water; be sure the sauce is hot enough when dipped into cans, leave no room in the can for air and germs. After filling a can, run a knife around inside to break the air bubbles, pour in more juice or boiling water until it overflows the can, then seal quickly.

Every fall there are apple culls that are not salable. Cider apple butter is a relic of the past worth preserving. One should have about equal parts of sweet cider, and apples that have been pared and sliced. Apples that are not very sour are better for the filling. The apples are cooked in the raw cider, without the addition of water. The remaining cider is cooked down in another kettle and added to the apple mixture, a little at a time, as it thickens. When cider apple butter is properly made, it is without sugar, is about the consistency of butter, and keeps without sealing. It should be kept in a cool place and covered with parraffine to prevent moulding.

After making apple butter, there is a quantity of cores and parings to be disposed of. What would make jelly of brighter color or finer flavor than these? Slice a few apples to put with them, cover with boiling water and cook until tender, drain over night in a jelly bag. Or, if there

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is more than a bagful, tie a loosely woven cloth over a large jar, so that the cloth will bag enough to hold the fruit but not touch the juice as it drains. In making jelly I use equal parts of juice and sugar, and cook until a drop will jell when placed on a cold dish. Remove all the skum as it rises. When ready to take from the fire, have a hot basin and cloth, the center of the cloth having been dipped into hot water. Drain each batch through this cloth and turn from the basin into hot tumblers. This makes a jelly clear as crystal, and one that will take a premium at the county fair. Mixed apple and rhubarb juice make good jelly, also elderberries and apples, the pieplant or elderberries imparting a high color and delicious flavor. Neither pieplant nor elderberries will make jelly alone.

One year while living on a south Missouri fruit farm, when peaches were very abundant, we canned freestone seedlings without any sugar whatever, and were surprised, when we opened them, to find the sauce as sweet as could be desired. This, was with peaches that had been fully ripened on the trees. Then we dried quantities of them by keeping the oven filled when not otherwise in use. Peaches need not be pared for drying, are not easily burned, and dry quickly. Like other fruit, they must be thoroughly heated at least once a day while drying.

I might give my special recipes for many kinds of fruit, but nearly, every housewife has access to a cook book. Any good cook book will tell better than I, how to care for any of the choice fruits.

THE PRESIDENT: While we have not been "chewing the rag" much, we haven't got to the real pudding until now. We will give our attention to "Our Backdoor Neighbors" (Illustrated), by Frank C. Pellett, Atlantic.

MR. PELLETT: I do not expect to tell you people anything especially new tonight, but want to show you some pictures of things with which you are all more or less familiar. I have also selected a number of insects with which we have to deal, and their natural enemies.

(Here Mr. Pellett presented the lantern slide photographs illustrating his subject.)

HORTICULTURAL PROGRESS IN IOWA.

B. F. FERRIS, HAMPTON.

Since Adam and his wife took possession of the historical garden, horticulture has been classed as one of the important branches of agriculture, and has advanced continually to the present time. Every one who has assisted in advancing horticulture has reason to be proud of the fact. Every effort has been an effort in the perfecting of home life and the increase of home comforts.

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Priesthood points out the life we should lead here. The legal fraternaties are supposed to protect each of us in our worldly possessions. Warriors fight and maim and kill each other, rulers plunge their people into unnecessary strife.

Whatever detracts from home comforts is eternally wrong. Whatever adds thereto is commendable. Our first duty is to provide necessary foods, next fruits, next ornamentals. All these are necessary and ornamental products are advanced as horticulture is advanced and perfected. Always advancing, but never perfect, each step brings to view other paths to be explored, other questions to be solved.

Are we doing the best we can? This society is endowed and is expetced to show results—so the question arises, are we doing the best we can?

I think Iowa is at least abreast of other states. We have learned and have tried to disseminate the knowledge that it will not do to always follow nature's example. Spraying and pruning, systematic culture and care, both experience and research; all these and more should have attention in order that we may reap the best results and give to posterity the benefits. The borers in our fruit shrubs should be kept in check by the destruction of infected canes, fruit trees should not be allowed to grow into live brush piles or breeders of disease and injurious insects, and we as leaders in horticulture should be able and willing to so record our thoughts that our experience may descend to others. It is a matter of congratulation that the reports of this society are more sought after by the general planter than ever before, and still the half never see them, and some that do, shelve them with national reports on different subjects and class all as dry incomprehensible matter. Others are anxious to get them and study the contents thoroughly. The reading of one report generally creates a desire for others and thus Iowa horticulture is advanced.

My experience makes me hesitate to mention the subject of spraying. Results have not been satisfactory. I believe the destruction of all diseased or affected fruit and wood, before it can impart its disease to other fruit or wood, is of as much or more importance than spraying. I hardly think, an orchard let to grow with a tangle of weeds and grass—really without care otherwise. can be made to furnish good apples just by spraying.

I repeat what I have said on a former occasion, the nursery inspection law should have attention. At present it may be beneficial but it is not perfect or satisfacory. Would not the appointment of a state inspector be an improvement?

About fifteen years ago we made a list of apple trees for the north part of our state, only four varieties, and Father Lathrop said it reminded h'm of a man with no protection but a shirt and a very short shirt at that. If this very worthy leader is still interested in our work and is able to look down and see what we are doing he is surely pleased at the change. The man now has not only a good supply of underwear but shoes, hat and a good suit of clothes. Our list has grown and perhaps no one man could name, off hand, all the trees fit to go into a family orchard in

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northern Iowa and Minnesota. Lathrop, Wragg, Foster, Clarkson, Haviland, McGeehan, Fluke, Ivins, Elder, Budd, Smith of Charles City, Reeve, and perhaps others that I do not now call to mind, have passed to the unknown country, but in our reports we can still commune with them and thus be inspired to new and greater efforts. Their advice and instruction was good, and their comradeship was great.

All honor to these doctors of horticulture, gone but not forgotten.

COMMERCIAL ORCHARDING IN IOWA.

W. T. WORTH, MONDAMIN.

I select this subject at this time to discourse on because so many people have recently left the state and gone west into the Rocky Mountain states to grow fruit on a commercial scale. They have seen so much glowing and exaggerative literature put out by the real estate gentry of that region and believing that if the half of it be true, they can quickly make their fortunes by growing those fancy apples and selling them at fabulous prices.

As there is no free literature given out or distributed to our people showing the advantages of our state in agriculture and horticulture, I find that many people in our state have come to the conclusion that almost any other place away off somewhere is far superior for horticultural and even agricultural purposes. I honestly believe that Iowa is superior to any of those western states and I shall try to give some of the reasons for this faith within me.

Now if there are other places where the growing of fruit is more profitable than it is in our state, then any person contemplating fruit growing as a business owes it as a duty to himself and family (if he have a family) to hike out and locate in the favored region, but so many jump at conclusions and without even considering any of the many advantages which this state offers and believing those western or southwestern states have no drawbacks whatever, then if they can just get there and secure a small tract of ten to fifteen acres of sand and gravel'y soil and covered with sage and grease brush, paying $250 to $600 per acre with a prospect of getting water on it by irrigation some time in the future, and if the company can sell enough of this land at such prices, to Iowa, Illinois and Missouri suckers to construct ditches and reservoirs they will then put in their "system" and furnish in that valley a certain amount of water, depending always on the amount of snow fall the previous winter and under such conditions they expect to get rich quickly and they really pity us poor mortals who are too ignorant or too indolant to pull up and leave such a worthless country.

Some advantages that Iowa has over most countries are first, soil; more especially sub-soil, 200 or 300 feet in depth, providing a great reservoir for holding water and giving it up by capillary attraction in times of drought and to furnish room and sustenance for root expansion

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in all directions. Second, our latitude which is the natural zone of the apple, pear, plum, cherry, strawberry, etc., while the southern part of the state is pretty well adapted to the growing of peaches. Third, is latitude, which is just about right and I think far superior to that Rocky Mountain plateau. Fourth, climate, which embraces a good deal and depends on conditions mentioned above, as latitude and altitude. I thought for many years that Iowa had a mighty poor climate. After making a close study of other regions for many years I learned to my great surprise that the state measured up favorably with the best parts of this earth and that Paradise is not properly a geographical term on this planet. I think some of the early horticultural reports are to blame for our conception of the Iowa climate and the behavior of all our fruits as judged from Story County, was made the criterion of severe and unfavorable criticism for many years.

My object in writing these lines is to try to repair some of the damage done. Our summer showers, our cloudy spells, our dewy nights, interspersed with sunny days, I include as features of the Iowa climate.

Fifthly, Markets. And this is probably the greatest of all and this we have without any agreement. We do not have to ship our fruits to the great eastern cities nor even to Chicago. We are right in and near the greatest agricultural empire in the world and the people round about are multiplying, replenishing this part of the earth and also becoming rich and able to buy all kinds of fruit and every part of the state is girdoned with railroads and can transport this fruit to all parts. It does not have to be sent two or three thousand miles to find a market.

Another advantage we have is cheaper lands, especially the rougher and bluffy section and they are far better than the higher priced and more level and more fertile sections for fruit growing. Those western people have taught us some valuable lessons in agricultural matters, they had to learn and adopt them, "'twas a ground hog case." They were so far from markets that ordinary fruit such as we had been putting up, when shipped such long distances would not sell for enough to pay for freight so they conceived the idea of sending out some strictly fancy fruit by a system of fancy grading and packing, heretofore unknown. The result was fancy prices and the false notion soon prevailed, that all fruits grown there were strictly fancy. I talked with some of those people at the National Horticultural Congress, they to'd on each other. The Idaho people said, the Washington people, after pruning, thinning and working in their small orchards all summer, only found about one apple in twenty fit for grading. I unmannerly asked what became of the other nineteen. Why—er—well—they were left on the ground as culls. Was there no market for them? N—o, or rather not yet, but we expect drying and canning factories that will handle the culls soon. Another good lesson they taught us, was, to limit the size of the orchard from about ten to twenty acres, to thin and spray thoroughly. Another valuable lesson was to warm up our orchards on frosty nights by burning crude petroleum in vessels specially prepared for the work, and while we do not have these killing frosts nearly so often as they do, we do have them sometimes in late spring and it is the worst and only serious

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drawback to fruit growing in this central region. Now we can ward off frost in the same way, just as easily, cheaply and effectively as they can as they failed to take out a patent on the process. We can also grade our fruit and pack it as they do. In other words we can and will have to discard the "Iowa methods" and adopt the Oregon and Washington methods. While all parts of the state are not ideal for commercial orchards enough of it is probably.

I am sure there are hundreds of suitable locations in Harrison, Pottawattamie, Mills, Fremont and other counties where a person can buy a small tract of this rough land for $60 to $70 per acre and fine Jonathans, Grimes, Esopus Spitzenburgs, Kieffer, Bartlett, Flemish Beauty, Howell, Sheldon and some other pears can be grown no where e'se in the world in greater quantities with less care. They are blight proof here it seems.

If this all be true, what more need be said, and if any of you doubt it come out here in the autumn Indian summer time and we'll "show you." I had thought of naming some of the drawbacks of the extreme western states. I do not want to discourage any one who is already in those regions named. My object is to caution our people to "look before they leap," as John Wilson of Appanoose county said. I thought sure I would say something of the dust on the leaves, the millions of Aphis or plant lice, myriads of field mice and Jackson Rabbits that can reach up and girdle the lower limbs of an ordinary tree, but space and time forbid.

WHAT FRUIT SHALL WE PLANT IN THE SOUTHERN PART OF IOWA.

CAPT. H. D. MC COY, KNOXVILLE.

All the great Horticulturists of this state and many from other states, agree that the greater part of the south half of Iowa, in soil and climate, is as well adapted to the growing of the apple as any part of the great United States. A profitable industry to be encouraged, especially so, considering the high quality and the richness of its flavor compared with the ill-flavored apples grown in California, Oregon and all other western apple growing states, including western Kansas and Nebraska and when sold in the market, where its standard of quality is known will bring a much higher price. If the orchardists of southern Iowa would take the proper interest in spraying and caring for their orchards as the orchardists of the great west do there would be something doing in the apple business in Iowa. Millions of dollars would be added to our wealth and a great reputation as a fruit growing state, whereas she is now in the rut.

It is true that in many localities other fruits are being as profitably grown as the apple, or apparently more so, but at a greater cost of labor and expense to the acre. For instance in a certain locality the pear, in another the cherry, the plum or the peach, the grape, strawberry and all

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other small fruits included, are profitably grown for home use and for the market; but for the greatest profit for the least expense and labor plant the apple. For commercial orchards there are thousands of acres in southern Iowa that are valuable for the apple orchard that are of little value for farm purposes. If utilized for the orchard it would be worth in a few years $500 to $1000 per acre by the income produced, and enhancing the value of the whole farm.

In selecting the varieties to plant purchase only the good trees that are known to be hardy, good bearers and do well in the locality in which you desire to plant your orchard, which you can do by noting such varieties as are being profitably grown in your locality. One may be sure that after my long experience in testing varieties that I am quite willing for the other fellow to do the testing. For home use you can plant as many varieties as you wish, but for the commercial orchard I would only recommend a few. I will recommend these six varieties to plant in the south half of Iowa, of value in the order named: First, the Jonathan, an early winter apple, good size, beautiful in color and sells for the highest price on the market, and if picked early will keep until spring if properly handled. Second, the Grimes Golden, early winter, a yellow variety, rich in flavor, good size, sells next to the Jonathan in the market, if picked early will keep until spring, if properly handled. Third, Wine Sap, winter apple should be whole root or top-drafted, a medium sized red apple, sells high in the market and may be kept until June if properly handled, a good fertilizer for the Jonathan. Fourth and fifth, Ben Davis and Gano, winter apples of the same quality, good size, good keepers, beautiful in color and sells well in the market and may be kept until June. Sixth, Willow Twig, late winter, large green apple with blush in the sun, sells well in the market and keeps well until July if properly handled.

TOPWORKING.

E. E. LITTLE, AMES.

The subject of topworking is of interest to both the amateur and commercial orchardist.

Topworking is not a difficult operation as the amateur might think but instead is a simple operation if the growth of the plant is carefully observed and this is especially true in topworking the apple. Almost any man with ordinary knowledge of trees can by a little practice readily do the work. It would not be advisable for a beginner to work on rare and valuable trees but rather begin work on undesirable ones or else practice on stubs cut from trees to be discarded or destroyed before attempting to do the work on the better and more valuable trees.

It is hardly necessary to say that fruits differing widely cannot be grafted such as the plum on apple and vice versa but the plum should be worked on the plum and the apple worked on the apple to give lasting results. The topworking is confined largely to the same kinds. Some-

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times two different kinds are worked and a partial union takes place between stock and cion but the union is not perfect and the results will not be lasting.

The essential thing to keep in mind when topworking, is the growth of the tree and the point of union takes place between the stock and cion just under the bark in a thin tissue layer of cells known as the cambium layer. Unless the cambium layers of both stock and cion or bud are brought together so they will touch each other they will not unite.

The time to do topworking is in early spring after the hard freezing weather is over. Apple grafting can be done from early spring until early summer but the stone fruits such as the plum and cherry should be worked just as the sap begins to flow and not left until after growth has begun. Budding is done in the late summer when the bark peels readily as at this time the stock will unite with the inserted bud.

Topworking is being practiced to some extent in the nursery and where special stocks are required for the successful production of fruit the amateur will find this a good method. It gives the grower a chance to se'ect matured and well formed trees desirable and hardy in every respect and allows him to plant trees in the orchard with uniform tops.

The trees in the orchard to be topworked should be hardy, vigorous, and in sound condition or else they are hardly worth changing to some other variety or varieties. Apples and pears are not difficult to graft after they have attained considerable size but the stone fruits such as the plum and cherry are more difficult to graft and only the strong young trees under the most favorable conditions should be worked.

The common method of topworking is well known and is commonly called cleft-grafting. Within the last few years a new method called Kerf-grafting is being used. Topbudding succeeds best on young trees and on the new growth.

Kerf-grafting is not difficult and by a little practice the amateur should be able to do it. It is similar to cleft-grafting, the only difference is in the preparation of the stock and cion. Instead of splitting the stub as is done in cleft-grafting, it is sawed on opposite sides forming V shape grooves and these are cut with a saddler's knife to make the surface smooth. The cion is cut the same as for cleft-grafting except on the inside lower end of it is cut sloping allowing it to be fit tightly into the opening. This method seems to have the advantage in that the stock is not split.

In selecting stocks for topworking hardy varieties should be selected grown on their own roots or root-grafted on hardy seedling roots and avoid the tender rooted trees.

Some of the best stocks thus far tested for topworking the apple is the Hibernal, Whitney and Virginia crabs. The former stock is very hardy and is a very desirable variety for northern Iowa. The two latter varieties have been used with varying success throughout different parts of the state during the last score of years. Some varieties succeed on these stocks under favorable conditions while others have not done well. Any grower should not grow them on any large scale to topwork until they have determined their value.

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Topworking allows the selection of hardy and desirable stocks, good straight and well formed tops. It gives the grower a chance to change the top from a poor variety to a hardy desirable kind either for home use or market. Wherever a grower has an unproductive tree he can change the top in three to five years by selecting some productive variety. It also allows the grower to select his cions or buds from trees producing good uniform fruit of good size, color and quality.

BLOOMING TIME OF PLANTS, EMMET CO., IOWA.

B. O. WOLDEN, OBSERVER.

Soft Maple	3-19
Hazelnut	3-19
Bloodroot	3-23
White Elm	3-23
Red Elm	3-23
Early Buttercup (*R. ovalis*)	3-23
Pasque Flower	3-23
Dandelion	3-24
Pussy Willow (*S. discolor*)	3-25
Box Elder	3-26
Heart-leaved Willow (*S. cordata*)	3-27
Dutchman's Breeches	3-27
Dentaria (*D. laciniata*)	3-27
False Rue-anemone (*Isopyrum biternatum*)	3-28
Cottonwood	3-28
Blue Violet (*V. papilionacea*)	3-29
Wood Anemone	3-31
Carex pennsylvanica	3-31
Buttercup (*R. septentrionalis*)	4- 2
Yellow Violet	4- 4
Ironwood	4- 6
White Adder's Tongue	4- 7
Plum	4- 7
Trillium (*T. erectum*)	4- 8
Hackberry	4- 7
Wild Gooseberry	4- 8
Prickly Ash	4- 8
Blue Phlox (*P. divaricata*)	4- 8
Shepherd's Purse	4- 9
Blue Cohash	4- 9
Wood Buttercup (*R. abortivus*)	4- 9
Bellwort	4- 9
Juneberry	4- 9
Black Willow	4-10
Sandbar Willow	4-10

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Green Ash 4-10
White Willow 4- 8
Cultivated Apple 4-10
Viola palmata 4-11
Everlasting 4-11
Wood Strawberry 4-12
Columbine 4-12
Sweet Vernal Grass 4-12
Jack-in-the-Pulpit 4-13
Meadow Strawberry 4-13
Lilac 4-14
Cultivated Cherry 4-14
Hawthorn 4-15
Corydalis 4-20
Wild Currant 4-24
Groundnut 4-15
Lousewort 4-24
Prairie Violet 4-24
Starflowered False Solomon's Seal 4-27
Water Crowfoot 4-27
Chokeberry 4-27
Wild Crab Apple 4-27
Indian Puccoon 4-30
Vetch (*Vicia Americana*) 4-30
Golden Meadow Parsnip 5- 1
Blue-eyed Grass 5- 1
Galium aparine 5- 1
Hydrophyllum macrocalyx 5- 1
Sweet Cicily 5- 4
Woodbine 5- 5
Yellow Woodsorrel 5- 6
Canada Violet 5- 6
Waterleaf 5- 6
Long-bracted Orchis 5- 7
Painted Cup 5- 8
Narrow leaved Puccoon 5- 8
Troximon 5- 8
Lithospermum latifolium 5- 8
Black Haw 5-12
Showy Orchis 5-14
Daisy Fleabane 5-15
White Clover 5-15
Yellow Star Grass 5-14
Broomrape 5-17
Wild Geranium (*G. maculatum*) 5-23
Spiderwort 5-25
Baneberry 5-25
Honewort 5-27
Sanicle (*Sanicula gregaria*) 5-27

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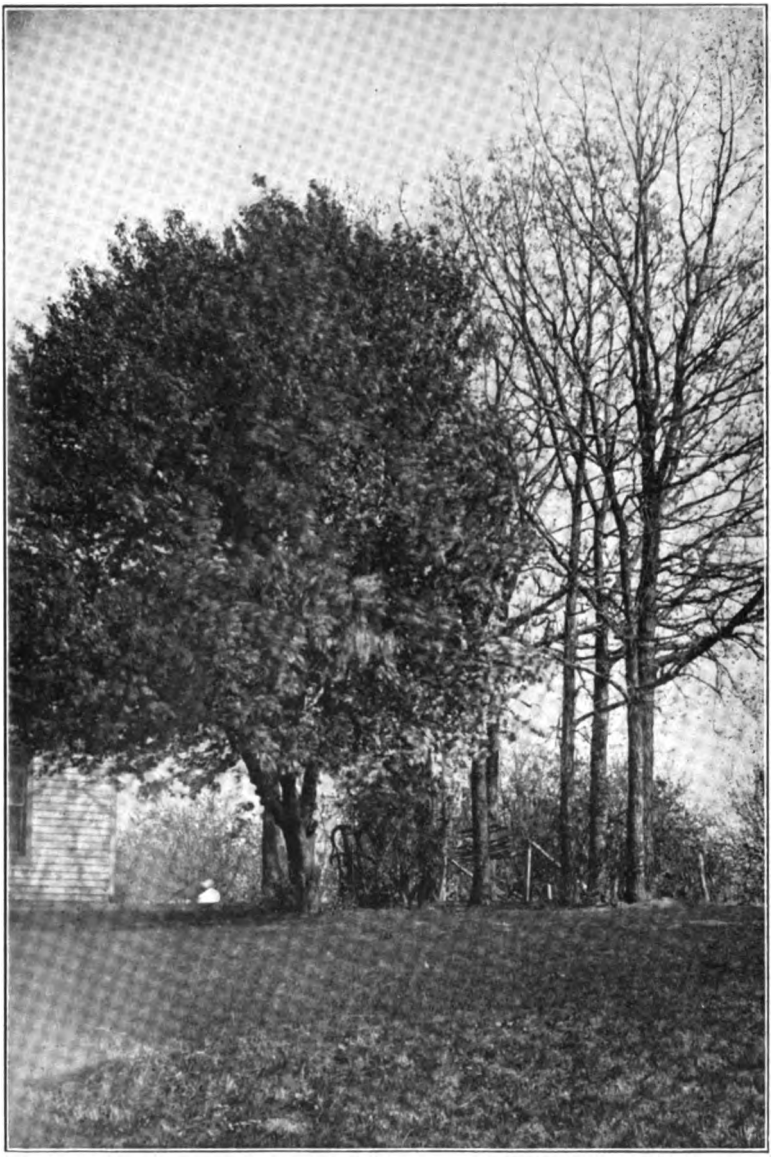

The May-day tree is one of the first to come into full foliage in the spring. It is hardy and gives a dense shade.

—Photograph from John Bowers.

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Red Clover 5-27
White Anemone 5-27
Wood Rose 5-28
Ladies' Slipper 5-28
Cow Parsnip 6-10
Cow Vetch 6-12
Wahoo 6- 8
Dogwood 6-13
Coffee Weed 6-13

March 31st. Chokeberry leaves, 2 inches long, Box Elder, Wolfberry, Gooseberry, Black Haw and Raspberry leaves, one inch long; Honeysuckle leaves two inches long. Plum tree buds almost ready to open.

April 9th, 95 degrees. April 17th, 22 degrees and three inches of snow. During this and suceeding frosts the leaves and shoots on all plants were killed, excepting apple trees.

NOTES ON PHENOLOGY, AMES, 1910.

CHARLOTTE M. KING.

That plants may be greatly retarded in vitality and development by unfavorable conditions of the preceding fall and winter, is amply illustrated in the state and progress of vegetation at Ames, for the spring of 1910.

This is pointed out in the report of Secretary of State Horticultural Society, in the following statement of conditions at close of the winter 1909-1910. "Apples, 85 per cent; pears, 80; American plums, 89; Domestica plums, 70; Japanese plums, 69; cherries, 83; peaches, 3; grapes, 80; red raspberries, 52; black raspberries, 53; blackberries, 65; strawberries, 86. Peach trees are badly injured in many places; raspberry canes are killed to the ground in some localities; climbing roses are also damaged.

The injury to trees and plants is attributed to the freeze in October, which caused the leaves to fall before the wood was mature, followed by warm, wet weather which pushed bud development on the defoliated plants too far in the fall to withstand the winter. Bloom in plum and cherry trees is two weeks in advance of 1871, the earliest record we have since the Society was organized."

The month of March, 1910, was phenomenally warm and dry; mean temperature 48.9°, to a general average for term of years of 34.1°. This earliness of season caused corresponding advance in plant development; reference to the list will show bloom of many plants two or three weeks before the usual time. The cold week with freezing temperatures in the middle of April, was attended by unusually harmful effect upon plants. Together with lack of sunshine, heat and moisture, this period was especially trying.

At Ames on the afternoon of April 16, came slight snow, melting as it fell; at seven o'clock the thermometer marked 32°. A light snowfall lay

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upon the grass and trees during April 17, remaining until morning. Temperature low all following day. For each of these three days the thermometer dropped to below 32°.

Immediate effects were noted as follows: Persian lilac, touched on exposed branches; basswood seriously touched; ornamental crab-apple, blossoms on outer portion of tree blighted; soft maple, new branches drooping and blighted, keys softened and injured; *Crataegus mollis*, flowers destroyed; *Berberis thunbergia*, flowers spoiled, leaves unharmed; hard maple, flowers showing injury; *Cercis canadensis*, flowers drooping.

The following were distinctly unharmed; dandelion, blue-grass, clover, *Polygonum aviculare*, shepard's purse, plantain.

Immediately upon the path of this cold snap, followed several cold days with the thermometer again falling below freezing upon April 20, 23, and 24.

The harm from this was general; the following results were noted; young shoots were killed of hackberry, basswood, elm, hard maple, soft maple, birch; flowers were killed of crab apple, hawthorn, plum and cultivated cherry.

Growing tips of white spruce and Jack pine were killed; larch and *Pseudotsuga tapifolia* were not harmed. The apple was variously injured according to shelter and variety; very many blossoms were killed.

The box elder was seriously damaged and made exceedingly slow recovery. The *Aesculus* was hurt where unsheltered.

Rhubarb and asparagus were killed down, while fruits of currant and gooseberry were destroyed. Young tips of sycamore suffered; seeds of elms and maples largely destroyed. *Amorpha fruticosa* and *Ailanthus* were injured; *Lonicera tartarica* recovered with difficulty. Sweet clover, except longest shoots, recovered; morning glory lost its tips; fertile horsetail plants were killed.

The following plants were apparently uninjured: Dock, clover, alfalfa, *Mertensia*, violet, spring beauty, ferns (*Aspidium* touched), Juneberry. On May 1 the strawberry was again blooming; late flowers of *Crataegus mollis* appeared, *Prunus serotina* in bloom, basswood recovering; honey locust and catalpa, no signs of recovery, leaves all frost-scorched, lily-of-the-valley blooming.

The range of late blossoming for this region is indicated by plants in bloom September 10, *Pyrethrum uliginosum*, *Gentiana alba*, *Aster multiflorus*, *A. cordifolius*, *A. tradescanti*, *A. azureus*, *A. Novae-angliae*, *Solidago latifolia*, *S. canadensis*, *S. rigida*, *S. ulmifolia*, *S. serolina*, *Euphorbia Preslii*, *E. Maculata*, *Geum strictum*, *Aster junceus*.

The warmer weather of early May encouraged the renewed growth of potato plants; while rains in this month were helpful to the berry crops. Many apple, cherry, plum trees and grape vines put forth new blossoms. The weather conditions of 1909 and 1910 indicate a crucial experience for Iowa forest, fruit and ornamental trees; in addition the weakened state thereby induced renders the trees more susceptible to insect and fungus pests.

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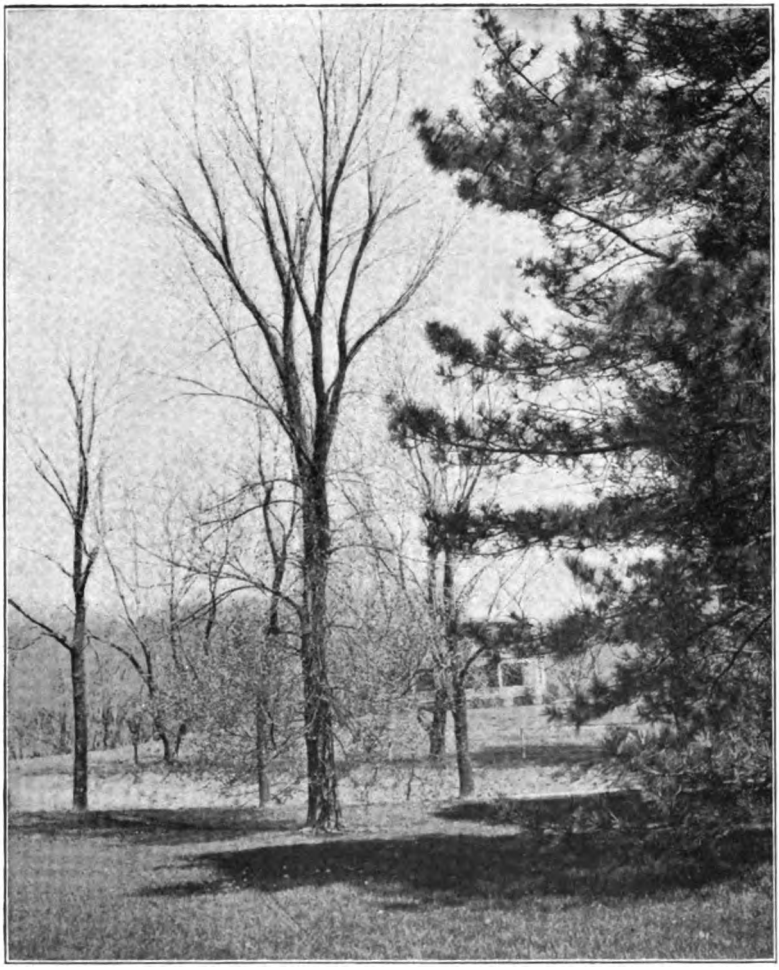

AMERICAN ELM

Upper leaves killed by frost, lower protected branches unharmed.

—Photograph by C. M. King.

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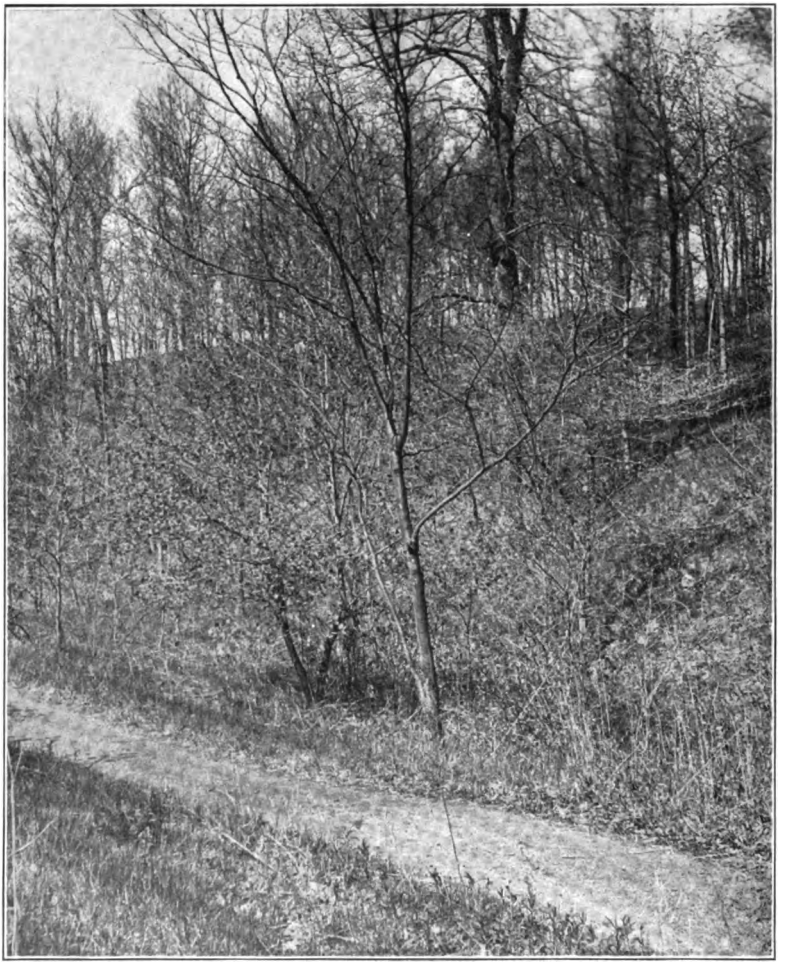

HONEY-LOCUST IN THE FOREGROUND
All young shoots and leaves destroyed by frost.
—Photograph by C. M. King.

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The earlier frost of the fall of 1910 occurred September 10; squash and prostrate pigweed were slightly touched. Between Ames and Marshalltown corn in lowlands was seriously injured.

Upon September 27 and 28 occurred the first heavy freeze of the season; the ripening of vegetation modified the seriousness of the effect. The most resistant plants were clover, blue-grass, petunias, *Malva*, dandelion, catnip, motherwort.

Blooming dates of plants in various Iowa localities, season of 1910, collected by several observers:

OTTUMWA.

Populus deltoides, Cottonwood 3-26
Amelanchier canadensis, Juneberry 3-26

BOONE I. S. C. BOTANY STUDENTS, OBSERVERS.

Caltha palustris, Marsh marigold 4- 1
Tillium nivali, Trillium (long past) 4- 1
Acer saccharum, Hard maple 4- 5
Cardamine bulbosa, Cardamine 4- 5
Syringa vulgaris, Lilac 4- 6
Ranunculus abortivus, Small-flowered buttercup 4- 6
Phlox divaricata, Blue phlox 4- 7
Crataegus mollis, Red hawthorn 4- 8
Ranunculus septentrionalis, Buttercup 4- 8
Antennaria plantaginifolia, Mouse-eared Chickweed 4-10
Baptisia leucantha, False Indigo 7- 1
Aralia racemosa, Wild Sarsaparilla 7-14
Lippia lanceolata, Fog-fruit 7-18
Polanisia graveolens, Polanisia 7-20
Festuca nutans, Nodding fescue 7-23
Arabis canadensis, Sickle pod (fruit) 7-23
Isanthus brachiatus, False Pennyroyal 7-23
Eleocharis, Spike rush 7-23
Batrychium virginianum, Moonwort (past) 7-23
Cystopteris fragilis, Bladder fern (advanced) 7-23

DATE OF BLOOM, BOONE, IOWA.

G. R. RINGLAND, OBSERVER.

Populus tremuloides, American aspen 3-12
Acer saccharinum, Soft maple 3-14
Ulmus fulva, Red elm 3-15
Taraxacum officinale, Dandelion 3-17
Ulmus americana, White elm 3-17
Acer negundo, Box elder 3-19

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Trillium nivale, Wake-robin 3-20
Hepatica acutiloba, Hepatica 3-21
Claytonia virginica, Spring beauty 3-22
Populus deltoides, Cottonwood 3-20
Salix discolor, Pussy willow 3-20
Amelanchier canadensis, Juneberry 3-26
Carex pennsylvanica, Common sedge 3-27
Corylus americana, Hazelnut 3-27
Ostrya virginiana, Hop-hornbeam 3-27
Sanguinaria canadensis, Bloodroot 3-28
Antennaria plantaginifolia, Mouse-ear 3-28
Viola cucullata, Common violet 3-29
Dicentra cucullaria, Dutchman's breeches 3-30
Isopyrum biternatum, False Rue anemone 3-30
Dentaria laciniata, Toothwort, pepperroot 3-30
Ribes cynosbati, Prickly gooseberry 3-31
Ranunculus abortivus, Small buttercup 3-31
Anemone nemorosa, Wind flower 3-31
Erythronium albidum, Dog-tooth-violet 4- 1
Prunus americana, Wild plum 4- 1
Zanthoxylum americanum, Prickly ash 4- 1
Capsella Bursa-pastories, Shepherd's purse 4- 3
Equisetum arvense, Horsetail 4- 3
Fragaria virginana, Wild strawberry 4- 4
Dicentra spectabilis, Bleeding heart 4- 4
Phlox divaricata, Wild phlox 4- 4
Quercus macrocarpa, Mossy-cup oak 4- 4
Acer saccharum, Hard maple 4- 4
Crataegus mollis, Red haw 4- 5
Ribes aureum, Yellow Missouri currant 4- 6
Pyrus malus, Cultivated apple 4- 7
Zizia aurea, Golden meadow parsnip 4- 7
Pyrus iowensis, Wild crab apple 4- 7
Caltha palustris, Marsh marigold 4- 8
Syringa vulgaris, Common lilac 4- 8
Prunus cerasus, Cultivated cherry 4- 9
Thalictrum dioicum, Early meadow rue 4- 9
Ranunculus septentrionalis, Early crowfoot 4- 9
Juglans cinerea, Butternut 4- 9
Prunus virginiana, Choke-cherry 4-10
Morus rubra, Russian mulberry 4-10
Quercus alba, White oak 4-10
Tilia americana, Basswood 4-10
Viola pubescens, Yellow violet 4-11
Viola pedatifida, Prairie violet 4-11
Asarum canadense, Wild ginger 4-11
Trifolium repens, White clover 4-12
Ellisia nyctelea, Ellisia 4-12
Geranium maculatum, Wild geranium 4-12

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Sisymbrium canescens, Tansy mustard 4-20
Convallaria majalis, Lily-of-the-valley 4-20
Juglans nigra, Walnut 4-20
Prunus serotina, Wild cherry 4-20
Vitaceae vulpina, Wild grape 4-20
Quercus rubra, Red oak 4-20
Ranunculus multifidus, Water-crowfoot 4-20
Smilacina stella'a, False Solomon's seal 4-25
Cardamine bulbosa, Bulbous Cress 4-25
Potentilla canadensis, Cinquefoil 4-25
Sisyrinchium angustifolium, Blue-eyed-grass 4-27
Lithospermum canescens, Orange-yellow puccoon 4-27
Habenaria bracteata, Green bracted orchid 4-28
Pedicularis canadensis, Lousewort 4-28
Euphorbia cyparissias, Cypress spurge 4-28
Stellaria media, Chickweed 4-28
Arisaema triphyllum, Jack-in-the-pulpit 4 28
Poa pratensis, Blue grass 4-30
Uvularia perforliata, Bellwort 4-30
Galium aparine, Cleavers 4-30
Orchis spectabilis, Showy orchis 4-30
Aquilegia canadensis, Columbine 5- 4
Lithospermum latifolium, Gromwell 5- 4
Smilax herbacea, Carrion-flower 5- 4
Osmorrhiza brevis'ylis, Woolly sweet cicely 5- 4
Cypripendium candidum, White Ladies' slipper 5- 4
Comandra umbellata, Bastard toadflax 5- 8
Orobanche uniflora, Naked broomrape 5- 8
Oxalis corniculata, Yellow sorrel 5- 8
Hypoxis hirsuta, Yellow star grass 5- 9
Senecio Balsamitae, Balsam groundsel 5- 9
Phlox pilosa, Prairie phlox 5-11
Rumex crispus, Curled dock 5-12
Arisaema Dracontium, Green dragon 5-16
Anemone pennsylvanica, Pennsylvania anemone 5-16
Pimpinella saxifraga, Yellow pimpernel 5-18
Crataegus tomentosa, Black haw 5-18
Hydrophyllum virginicianum, Waterleaf 5-18
Rubus occidentalis, Wild rapsberry 5-18
Mitella diphylla, Two leaved mitrewort 5-18
Polygona'um commutatum, Solomon's Seal 5-19
Tradescantia virginiana, Spiderwort 5-21
Podophyllum peltatum, May apple 5-21
Virburnum pubescens, Downy arrow-wood 5-21
Chenopodium urbicum, Pigweed 5-21
Trios'eum perfoiatum, Feverwort 5-22
Erigeron annus, Fleabane 5-22
Rosa blanda, var. Arkansana, Wild rose 5-20
Senecio aureus, Golden ragweed 5-20

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Trifolium pratense, Red clover 5-22
Eleaognus angustifolia, Wild olive tree 5-23
Sisymbrium officinale, Common mustard 5-28
Philadelphus coronarius, Syringa 5-28
Iris versicolor, Large blue flag 6-10
Vicia cracca, Tufted vetch 6-10
Pastinaca sativa, Wild parsnip 6-10
Melilotus alba, White sweet clover.....6-12
Thalictrum dasycarpum, Meadow rue 6-14
Physalis pubescens, Hairy ground cherry 6-15
Stachys tenuifolia, Hedge nettle 6-15
Heliopsis scabra, Rough ox-eye 6-19
Verbascum Thapsus, Mullein 6-20
Alfalfa (escaped cultivation) 6-20
Sambucus canadensis, Elder 6-21
Anthemis Cotula, Mayweed 6-21
Polygonum pennsulvanicum, Pennsylvania smartweed 6-21
Teucrium canadense, Germander 7- 4
Verbena stricta, Vervain 7- 4
Geum canadense, White avens 7- 4
Mimulus ringens, Monkey-flower 7- 6
Nepeta Cataria, Catnip 7- 6
Asclepias Sullivantii, Milkweed 7- 6
Linum usitatissimum, Common flax 7- 2
Rhus glabra, Smooth Sumac 7- 2
Convolvulus sepium, Hedge bindweed 7- 2
Monarda fistulosa, Horsemint, ...7- 8
Asclepias incarnata, Milkweed 7-10
Sonchus asper, Spiny sow thistle.....7-10
Campanula americana, Tall bellflower 7-10
Helianthus grosse-serratus, Sunflower 7-10
Silphium perfoliatum, Cup-plant 7-10
Onosmodium molle, False Gromwell 7-10
Silene stellata, Starry campion 7-12
Oenothera biennis, Primrose, ...7-12
Veronica virginica, Culver's physic 7-15
Solanum carolinense, Horse nettle 7-20
Ambrosia artemisiifolia, Ragweed 7-20
Eryngium yuccifolium, Rattlesnake master 7-28
Ipomea purpurea, Morning glory 7-28
Eupatorium purpureum, Joe-Pye weed 8- 4
Vernonia fasciculata, Western Iron weed 8- 6
Hibiscus trionum, Flower-of-an-hour 8-10
Lychnis alba, White campion 8-10
Liatris pycnostachya, Button snakeroot 8-12
Impatiens biflora, Touch-me-not 8-12
Gentiana alba, Closed white gentian 8-12
Solidago rigida, Goldenrod 8-20
Aster novae-angliae, New England aster 8-20

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Clematis paniculata, Clematis 9- 3
Spiranthes cernua, Ladies tresses 9-12
Prenanthes alba, Rattlesnake root 9-15

ROCK RAPIDS.

Acer saccharinum, Soft maple 3- 8

AMES.

Acer saccharinum, Soft maple 3-17
Ulmus americana, White elm 3-20
Ulmus fulva, Red elm 3-20
Acer Negundo, Boxelder 3-20
Claytonia virginica, Spring-beauty 3-21
Dicentra cucullaria, Dutchman's Breeches 3-22
Salix discolor, Willow 3-22
Populus deltoides, Cottonwood 3-23
Amelanchier canadensis, Juneberry 3-26
Dentaria lacinia'a, Toothwort 3-30
Celtis occidentalis, Hackberry 3-30
Isopyrum biternatum, Wind-flower 3-30
Viola cucullata, Blue violet 3-30
Sanguinari canadensis, Bloodwort 3-30
Viola pedata, Bird-foot violet 3-30
Viola pedatifida, Bird-foot violet 3-30
Erythronium albidum, Dogtooth violet 4- 1
Caltha palustris, Marsh marigold 4- 1
Capsella Bursa-pastoris, Shepherd's purse 4- 2
Phlox divaricata. Blue Phlox 4- 4
Berberis thunbergii, Russian barberry 4- 6
Pyrus Sinensis, Japan pear 4- 6
Syringa vulgaris, Lilac 4- 6
Acer saccharum, Hard maple 4- 7
Ribes aurem, Missuori currant 4- 7
Ranunculus septentrionalis, Buttercup 4- 9
Quercus macrocarpa, Bur oak 4- 9
Ribes gracile, Missuori gooseberry 4- 9
Fragaria, Strawberry (cultivated) 4- 9
Fragaria virginiana, Wild strawberry 4- 9
Pyrus malus, Cultivated apple 4- 9
Crataegus mollis, Red hawthorn 4-10
Taraxacum officinale, Dandelion (seeds ripe) 4-10
Geranium maculatum, Wild geranium 4-12
Lithospermum canescens, Hoary puccoon 4-12
Lonicera Tartarica, Tartarian honeysuckle 4-13
Pyrus japonica, Japan quince 4-13
Pyrus Soulardi, Soulard crab 4-13
Staphylea trifolia, Bladdernut 4-14
Sisymbrium canescens, Hedge mustard 4-15
Mertensia, Bluebell 4-15

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Potentilla canadensis, Cinquefoil 4-15
Ranunculus abortivus, Small-flowered buttercup 4-15
Euphorbia Cyparissias, Spurge 4-15
Aesculus glabra, Buckeye 4-15
Prunus virginiana, Choke cherry 4-16
Pyrus ioensis, Wild crab apple 4-16
Trifolium repens, White clover 5-13
Trifolium pratense, Red clover 5-13
Oxalis corniculata, Yellow oxalis 5-16
Crataegus punctata, Hawthorn 5-17
Tradescantia virginiana, Spiderwort 5-24
Rumex acetosella, Sorrel 5-24
Anemone canadensis, Anemone 5-24
Capsella Bursa-pastoris (seeds ripe) 5-25
Rumex crispus, Curled dock 5-26
Fragaria, strawberry (ripe) 5-26
Sisymbrium officinale, Hedge mustard 5-26
Lepidium apetalum (seeds ripe) 5-27
Achillea Millefolium, Yarrow 5-28
Brassica arvensis, Charlock 5-28
Rosa, Yellow rose 5-28
Erigeron ramosus, Daisy fleabane 5-30
Erigeron annuus, Fleabane 5-30
Delphinium azureum, Larkspur 6- 1
Brauneria purpurea, Purple cone flower 6- 4
Rosa pratincola Wild rose 6- 8
Medicago sativa, Alfalfa 6-10
Melilotus alba, Sweet clover 6-11
Avena, oats in head 6-13
Physalis lanceolatus, Ground cherry 6-15
Daucus carota, Wild carrot 6-18
Thalictrum revolutum, Meadow rue 6-18
Sumbucus canadensis, Elder 6-18
Apocynum cannabinum, Dogbane 6-18
Verbascum Thapsus, Mullein 6-18
Lilium philadelphicum 6-18
Nepeta cataria, Catnip 6-20
Sonchus oleraceus, Sow thistle 6-20
Pastinaca sativa, Parsnip 6-20
Phleum pratense, Timothy 6-21
Polygonum Persicaria, Smartweed 6-22
Potentilla canadensis, Cinquefoil 6-22
Potentilla monspeliensis, Five-finger 6-22
Plantago rugelii, Rugel's plantain 6-23
Anthemis Cotula, Mayweed 6-27
Psoralea argophylla, Psoralea 6-28
Asclepias purpurascens, Milkweed 6-30
Asclepias syriaca, Milkweed 6-30
Erigeron annuus, Fleabone 7- 2

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Psoralea argophylla, Psoralea 7- 2
Grindelia squarrosa, Grindelia 7- 2
Daucus carota, Wild carrot 7- 2
Galium boreale, Bedstraw 7- 3
Bruneria purpurea, Purple coneflower 7- 3
Silene stellata, Starry Campion 7- 4
Cassia Chamaecrista, Partridge Pea 7- 6
Lepachys pinnata, Cone flower 7- 7
Physalis heterophylla, Ground cherry 7- 7
Convolvulus arvensis, European morning glory 7- 7
Convolvulus sepium, Wild morning-glory 7- 8
Astragalus canadensis, Milk vetch 7-10
Monarda fistulosa, Horsemint 7-10
Potentilla arguta, Five finger 7-10
Potentilla monspeliensis, Five-finger 7-10
Solanum nigrum, Nightshade 7-10
Verbena hastata, Blue vervain 7-11
Verbena stricta, Blue vervain 7-12
Verbena bracteosa, Bracted vervain 7-12
Euphorbia corollata, Spurge 7-12
Lactuca scariola, Prickly Lettuce 7-12
Elymus robustus, Wild rye 7-14
Silphium laciniatum, Compass Plant 7-14
Radicula palustris, Cress 7-14
Eragrostis pilosa, Pilose eragrostis 7-15
Cirsium arvense, Canada thistle 7-15
Agrostis alba, Red top 7-15
Prenanthes alba, Rattlesnake root 7-15
Agrimonia striata, Agrimony 7-16
Zea mays, Corn 7-16
Scrophularia marilandica, Simpson honey-plant 7-16
Asclepias tuberosa, Butterfly weed 7-16
Eragrostis megastachya, Stink-grass 7-16
Hibiscus Trionum, Shoestring 7-16
Verbena urticaefolia, White vervain 7-16
Silphium perfoliatum, Cup-plant 7-16
Amorpha canescens, Lead plant 7-16
Eryngium yuccifolium, Rattlesnake master 7-17
Cacalia tuberosa, Indian plantain 7-18
Petalostemon candidum, White prairie clover 7-20
Erigeron canadensis, Horseweed 7-20
Lythrum alatum, Loosestrife 7-20
Asclepias verticillata, Whorled milkweed 7-20
Circaea lutetiana, Enchanter's nightshade 7-20
Artemisia frigida, Wormwood 7-20
Tilia americana, Linden 7-20
Solidago missouriensis, Missouri goldenrod 7-20
Rhus glabra (fruit full grown) Sumac 7-20
Amaranthus retroflexus, Pigweed 7-20

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Amorpha fruticosa, False indigo 7-20
Polygonum convolvulus, (last bloom) Bindweed 7-20
Petalostemon violaceum, Purple prairie clover.....7-21
Plantago lanceolata, Ribgrass 7-22
Veronica peregina, (fruit) Speedwell 7-22
Oxalis corniculata, (full bloom) Yellow oxalis 7-23
Euonymus atropurpurea, (early fruit) Wahoo 7-23
Pilea pumila, (advanced) Richweed 7-23
Stachys palustris, Hedge nettle 7-23
Malva rotundifolia (advanced) Mallow 7-23
Smilax herbacea, (fruit) Greenbrier 7-23
Ceanothus americanus, (height) New Jersey tea 7-23
Lepidium apetalum, (later bloom) Peppergrass 7-23
Typha latifolia, (early fruit) Cat tail 7-23
Veronica virginica, (full bloom) Culver's root 7-23
Lobelia spicata, (last bloom) Lobelia 7-23
Pedicularis canadensis, (ripe fruit) Lousewort 7-23
Heracleum lanatum, (ripe fruit) Cow parsnip 7-23
Panicum virgatum, Switchgrass 7-23
Atriplex patula, Orache 7-23
Desmodium canadense, (height) Tick seed 7-23
Brassica arvensis, (height) Charlock.....7-23
Lactuca canadensis, (height) Wild Lettuce 7-23
Cicuta maculata, (height) Water hemlock 7-23
Rudbeckia hirta, (height) Yellow cone flower 7-23
Melilotus alba, (height) Sweet Clover 7-23
Heliopsis scabra, (height) Ox eye 7-23
Anthemis Cotula, (height) Mayweed 7-23
Lappula echinata, Beggar's tick 7-23
Sisymbrium officinale, (height) Hedge mustard 7-23
Asclepias incarnata, (height) Milkweed 7-23
Chenopodium album, (early) fruit, Lamb's quarter 7-23
Sanicula marilandica (height) Tanich 7-23
Sambucus canadensis, (late bloom) Elder 7-23
Polygonum Persicaria, (height) Lady's thumb 7-23
Saponaria Vaccaria, (height) Cowherb 7-23
Raphanus Raphanistrum, (height) Radish 7-23
Polygonum Pennsylvanicum, (height) Smartweed 7-23
Acnida tuberculata, Water hemp 7-23
Cucurbita Pepo, Pumpkin 7-23
Erysimum cheiranthoides, Treach mustard 7-23
Solanum tuberosum, (late bloom) Potato 7-23
Tanacetum vulgare, (height) Tansy 7-23
Pastinaca sativa, (bloom and fruit ripening) Parsnip 7-23
Rosa pratincola, (last bloom) Rose 7-23
Coreopsis palmata, Tickseed 7-24
Salsola Kali, Russian thistle 7-24
Lolium perenne, Rye grass 7-25
Oenothera serrulata, Evening primrose 7-26

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Prunella vulgaris, Self-heal 7-28
Linaria vulgaris, Toad flax 7-29
Scutellaria galericulata, (last bloom) Monkshood 8-15
Mimulus ringens, Monkey flower 8-10

BLOOMING AT AMES, SEPTEMBER 1, 1910.

Helianthus grosseserratus, Wild sunflower.
Prenanthis alba, Rattlesnake root.
Sorghastrum nutans, Indian grass.
Andropogon scoparius, Beard grass.
Sporobolus cryptandrus, Dropseed.
Solidago rigida, Stiff goldenrod.
Solidago canadensis, Canadian goldenrod.
Solidago ulmifolia, Elm-leaved goldenrod.
Helenium autumnale, Sneezewort.
Rudbeckia hirta, Cone flower.
Euphorbia preslii, Spurge.
Euphorbia maculata, Spurge.
Rudbeckia triloba, Cone flower.
Polygonum Convolvulus, Bindweed.
Melilotus alba, Sweet clover.
Taxasacum officinale, Dandelion.
Convolvulus sepium, Wild morning-glory.
Convolvulus arvensis, European morning-glory.
Polygonum pennsylvanicum, Smartweed.
Cirsium lanceolatum, Field thistle.
Crisium discolor, Wood thistle.
Cirsium ioensis, Iowa thistle.

PAST HEIGHT, SEPTEMBER 1, 1910.

Boutelona curtipendula, Mesquite grass.
Lobelia siphilitica, Lobelia.
Eupatorium purpureum, Horehound.
Campanula americana, Bellwort.

LATE BLOOM, AMES.

Kuhnia eupatorium Kuhnia..... 9-20
Gentiana andrewsii, Gentian..... 9-20
Gentiana puberula, Blue gentina..... 9-20
Grass mildew (general)..... 9-20
Solidago speciosa, Showy goldenrod 9-20
Vitis, Cultivated grape, 2d bloom 9-27
Syringa vulgaris, Lilac, 2d bloom 10-18
Sitaria glauca, late bloom 10-18
Viola cucullata, Violet, 2d bloom 10-18

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DATE OF BLOOM FOR A NUMBER OF SPRING PLANTS FOR THE YEARS 1901 to 1910, FOR AMES.

	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
Soft maple	-----	3-11	3-17	4- 2	3-23	4- 2	3-18	3-17	4- 3	3-17
Juneberry	4-26	4-24	4-18	4-30	4-20	4-20	4-23	4-16	5- 6	3-26
Columbine	5- 7	-----	5-14	5-13	-----	5- 4	5-17	5-10	5-25	5- 5
Marsh marigold	4-27	4-19	4-13	4-15	4-20	4-21	4-23	4-27	5- 3	4- 1
Shepherd Purse	4-27	4- 7	4- 7	4-10	4-18	4-10	5- 1	4- 5	4-12	4- 2
Dandelion	4-24	4- 1	4- 7	4- 7	4-20	3-28	4-15	4-13	4- 4	3-30
Dutchman's Breeches	4-20	4-19	4-11	4-17	4- 7	4-12	4-15	4-14	4-24	3-22
Dog-tooth Violet	4-25	4- 9	4-14	4-28	4-11	4-19	4- 9	4-14	5- 2	4- 1
Wild Geranium	5- 9	-----	5-11	5-13	5- 9	5- 3	5- 6	5- 8	5-12	4-12
Bluebell	4-25	4-19	4-16	4-24	5- 2	4-29	4-10	4-25	5- 6	4-15
Box-elder	4-29	4-19	-----	4-27	4- 9	4-15	4- 2	4- 9	4-19	3-20
Blue Grass	5-19	-----	-----	-----	-----	5- 2	5-18	5-29	6- 6	5-10
Cottonwood	4-24	-----	-----	4-12	-----	4-22	3-30	4- 7	4-30	3-23
Blue Phlox	-----	4-28	4-24	5-10	5-21	4-28	-----	4-25	5-18	4- 4
Wild Crab Apple	-----	5- 9	-----	5- 9	5- 9	5-10	5-19	4-25	4-21	4-16
Buttercup	4-28	4-23	4-18	5- 4	4-21	4-25	4-30	4-25	5- 6	4- 9
Missouri Currant	-----	4-25	4-22	5- 5	4-22	4-26	-----	4 18	5-21	4- 7
Blood Root	4-20	4- 8	4- 9	4-17	3-31	4- 8	4- 9	4- 9	4-20	3-30
Red Clover	-----	5-19	-----	-----	5-19	5-21	5-21	5-26	6- 2	5-13
Red Elm	-----	4- 2	4- 1	4-22	-----	4- 6	3-22	4- 4	4-12	3-20
Blue Violet	4-20	4-19	4-18	4-25	4-16	4-21	4-10	4-13	5- 5	3-30
Water-flag	-----	-----	6- 1	6-16	-----	-----	7-26	5-28	6-10	6-10
Wild Grape	5- 6	5-21	5-24	5-18	-----	5-25	5-30	5-25	6- 6	4-20
Catalpa	-----	6- 4	6-14	6-15	6-15	-----	7- 1	-----	6-20	-----
Canadian Lily	-----	-----	7-10	6-16	-----	-----	-----	7-11	7-13	-----
Mullein	-----	6-17	-----	7- 8	6-19	6- 6	7- 3	6-17	7-10	6-18
Elder	-----	-----	-----	6-28	6-20	6-21	-----	6-10	6-30	6-18
Purple Coneflower	-----	6-13	6-10	7-10	6-15	-----	-----	6-23	7- 8	6- 4
Wild sunflower	-----	-----	7-18	7-28	-----	-----	7-25	-----	8-19	8-15
White Clover	-----	5-19	5-19	5-27	5-22	5- 4	5-25	5-16	5-24	5-13
Wild rose	-----	5-26	5-20	5-29	6- 6	-----	6-11	5-25	6- 6	5-30

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WEATHER RECORDS FOR AMES, 1900-1910.

Year	JANUARY				FEBRUARY				MARCH				APRIL				MAY				JUNE			
	Temperature (degrees)			Precipitation (inches)	Temperature (degrees)			Precipitation (inches)	Temperature (degrees)			Precipitation (inches)	Temperature (degrees)			Precipitation (inches)	Temperature (degrees)			Precipitation (inches)	Temperature (degrees)			Precipitation (inches)
	Max.	Min.	Mean.		Max.	Min.	Mean.		Max.	Min.	Mean.		Max.	Min.	Mean.		Max.	Min.	Mean.		Max.	Min.	Mean.	
1900	36.	16.8	23.4	.38	----	5.3	----	.45	----	22.1	----	2.81	----	41.3	----	2.61	76.3	52.4	64.4	4.36	81.8	57.	69.4	6.79
1901	33.2	11.1	23.6	.37	26.9	9.1	18.	.9	43.5	25.	34.3	1.61	61.3	36.8	49.	1.82	73.5	49.3	61.4	3.69	85.6	59.3	74.4	2.33
1902	32.7	10.8	21.8	1.32	26.(	4.	15.3	.38	50.1	30.1	40.1	2.70	61.2	35.6	48.6	2.31	75.9	52.	64.2	3.69	75.1	53.1	65.(	10.01
1903	34.3	13.8	24.	.14	30.5	8.(	19.6	.9	47.6	29.3	38.4	.61	61.9	37.8	9.8	1.97	72.3	52.3	62.3	9.48	75.1	51.6	64.(	1.97
1904	22.5	5.6	14.	.50	25.8	4.	14.9	.4	3.9	26.1	35.	1.63	53.2	33 8	45.	1.19	72.8	47.2	60.	1.69	78.6	51.3	67.4	3.45
1905	27.7	1.3	11.5	.6(	23.7	3.(	3.5	.6(	53.3	31.8	41.	2.30	58.8	35.9	47.4	1.33	70.2	46.6	58.4	5.51	81.	59.8	70.4	4.23
1906	34.7	5.	21.8	1.12	34.5	14.1	24.3	.28	55.6	20.1	27.8	.58	65.1	40.3	52.7	3.16	73.2	48.4	60.8	1.73	80.9	55.3	68.1	3.71
1907	28.1	9.9	19.	.79	36.	15.4	25.7	.5(	51.5	29.9	40.7	.27	51.2	29.8	48.	.67	66.9	40.	53.4	3.54	77.	52.8	64.9	3.26
1908	32.(	3.5	21.8	.55	32.9	16.(	24.8	1.5	8.7	27.5	38.1	.45	63.4	37.3	50.(	1.94	70.4	48.2	59.3	.95	77.9	56.1	67.	3.93
1909	32.8	14.3	23.6	1.36	37.6	16.7	27.2	1.4(	0.9	22.6	31.8	1.71	50.9	35.5	47.7	6.12	73.1	45.7	59.4	4.17	81.8	58.8	70.3	5.
1910	27.3	7.	17.2	1.30	27.	5.2	16.1	.3(	2.(	35.1	48.	1.32	68.3	39.	53.6	5.	68.3	42.9	55.6	1.79	82.1	55.4	68.8	2.88
Average for 34 years (1876-1910)	----	----	18.	9.3	----	----	21.4	.8	----	----	34.1	.75	----	----	48.9	2.75	----	----	60.3	4.34	----	----	69.4	4.48

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WEATHER RECORDS FOR AMES, 1900-1910.

Year	JULY				AUGUST				SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER					
	Temperature (degrees)			Precipitation (inches)	Temperature (degrees)			Precipitation (inches)	Temperature (degrees)			Precipitation (inches)	Temperature (degrees)			Precipitation (inches)	Temperature (degrees)			Precipitation (inches)	Temperature (degrees)			Precipitation (inches)	Av. mean degrees	Av. precipitation (inches)
	Max.	Min.	Mean.		Max.	Min.	Mean.		Max.	Min.	Mean.		Max.	Min.	Mean.		Max.	Min.	Mean.		Max.	Min.	Mean.			
1900	85.3	60.6	73.	9.14	88.3	65.	76.8	5.46	77.8	54.2	66.	7.12	72.1	47.4	59.8	3.73	42.1	24.4	33.3	.51	36.5	17.8	27.2	.19	---	3.24
1901	99.	67.6	83.3	2 26	88.2	57.5	----	1.21	76.2	47.	61.6	3.65	66.4	41.4	53.9	2.98	50.7	25.1	37.9	.67	28.6	12.6	20.7	.57	[illegible]	2.32
1902	93.6	69.1	72.8	8.06	78.6	60.	69.3	7.12	71.7	48.	59.8	1.64	65.5	40.	52.8	2.56	50.2	31.3	40.8	1.11	30.5	10.1	20.6	1.86	47.[illegible]	15.97
1903	84.3	62.5	73.	4.77	78.8	59.9	69.4	3.7	71.2	49.8	60.5	1.46	63.8	39.5	51.6	1.07	44.1	26.[illegible]	35.2	.14	31.4	9.	20.	.1	47.	26.41
1904	81.5	58.9	70.2	2.39	81.8	56.3	69.	3.37	75.5	53.5	64.5	3.37	65.6	41.5	53.6	1.78	54.1	28.5	41.3	.02	31.8	12.8	22.2	.79	46.	25.58
1905	89.6	60.	70.4	2.1	84.4	64.[illegible]	75.4	3.03	73.8	54.6	64.7	2.96	60.[illegible]	38.4	49.4	3.5[illegible]	50.	26.5	38.2	2.1	30.[illegible]	17.3	23.2	.2	8.	3.02
1906	83.3	57.9	70.6	4.03	85.	62.5	73.8	5.28	78.8	54.9	66.8	3.4	64.1	38.	51.	1.72	44.1	27.3	35.7	1.74	36.5	17.6	27.	.7	48.[illegible]	7.22
1907	81.8	54.7	69.8	5.32	82.3	----	----	6.15	74.1	50.6	62.4	2.14	62.9	36.6	49.8	3.04	48.7	25.2	36.	1.02	38.6	19.5	29.	.83	----	27.58
1908	85.2	60.4	72.8	3.6	81.5	56.5	69.	5.9	80.3	51.9	66.1	5.	65.	39.8	52.4	6.23	----	----	----	----	37.1	17.7	27.6	.57	----	----
1909	82.5	62.1	72.3	3.	83.6	62.8	76.2	.52	73.1	0.4	51.8	2.82	61.	37.2	49.1	1.59	54.1	31.	42.8	1.16	23.2	6.9	15.	5.29	48.	17.19
1910	88.2	59.1	73.6	1.69	87.3	59.6	72.4	2.75	76.	51.	63.5	4.62	68.3	41.	54.6	1.05	45.7	26.8	.12	----	----	----	---	---	--	----
Average for 34 years (1876-1910)	----	----	74.1	4.3	----	----	72.2	3.6	----	----	63.6	4.4	----	----	51.	2.51	----	----	34.4	1.16	----	----	----	----	----	----

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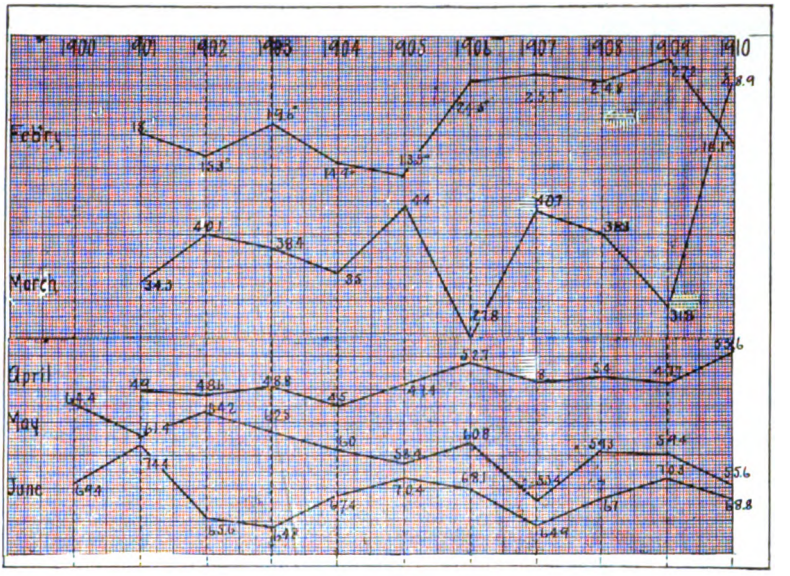
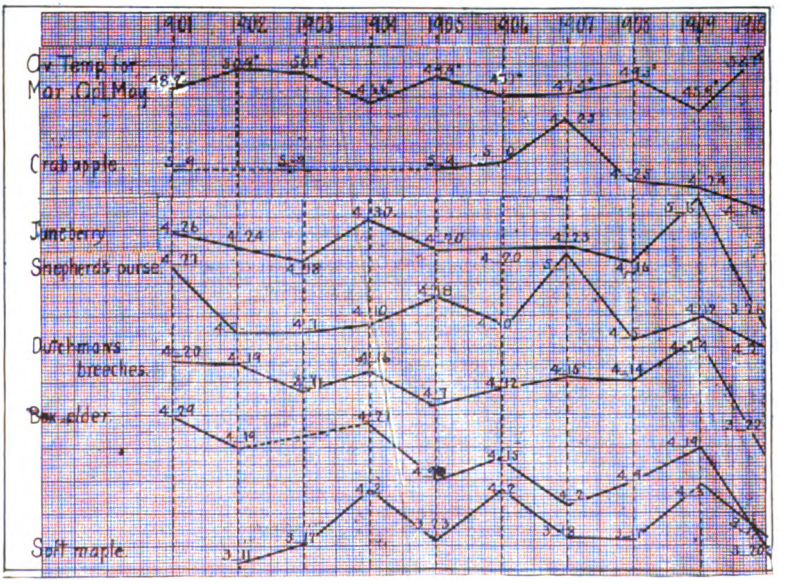


Comparison of temperatures of spring months, for Ames, for a period of eleven years



Comparison of blooming seasons, with average temperatures for Ames, for a period of ten years.

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NOTES ON FUNGOUS DISEASES OF PLANTS.

L. H. PAMMEL, AMES.

HANDBOOKS ON MYCOLOGY AND FUNGOUS DISEASES OF PLANTS.

American mycology has not made the advances it should have because of the lack of suitable information brought together in convenient form. During the past year, a number of publications present the subject in a manner to make the material usable. Some years ago, Prof. A. D. Selby of the Ohio Agricultural Experiment Station, published a brief handbook of the diseases of plants.* During the present year he has issued a revised edition of the same** which is much more extended and amplified. He has introduced a general account of plant diseases, discussing the same under the following headings: Leaf Spot and Shot-hole Effects; Leaf Impairment Through Fungus Coverings; Wilt Diseases—Seedling Collapse; Plant Diseases Not Beyond Explanation; Groups of Parasitic Diseases; Naming Plant Diseases; The Plant or Host in Relation to Disease; The Plants Protection Against Parasites; Disease Resistance in Plants; Concerning Parasitic Fungi; Classes of Fungi; Particular Facts About Parasitic Fungi; The Survival of Parasitic Fungi: Resting Forms Among Fungi; How These Parasites Rob the Hosts; How Parasitic Fungi Affect the Host; Beneficial Organisms; Root Nodules, etc.; The Proof of Parasitic Cause in Plant Disease; Method of Inoculation from Cultures; Culture Proof Not Always Possible; Enzymatic Diseases of Plants; Chlorosis or Panachure; Plant Diseases Transmitted in the Seed; How to Examine Seeds for Infection; The Limits in Seed Treatment; Methods of Seed Treatment; Soil Infesting Parasites in Field and Forcing House; The Avoidance and Prevention of Soil Infesting Diseases; Soil Treatment in the Forcing House; The Best Forcing House Practice; Root Diseases and Root-Rot Fungi of Orchards; Parasitic Foliage Diseases; Biting and Sucking Insects and Leaf Diseases; Wounds and Wound Infection; Timber Rots and Timber Preservation; Atmospheric Conditions as Affecting Plant Diseases; Remedies for Plant Diseases—Fungicides; Soil and Soil Treatment; Spraying with Fungicides; Soil and Soil Treatment; Spraying with Fungicides—Insoluble Copper Compounds; The Use of Stickers in Spray Mixtures; Sulfur Compounds as Fungicides; Solutions for Seed Treatments and Disinfection; Rot Disease Losses in Storage; Storage Rots of Apples and Pears; Storage Rots of Potatoes, Onions, etc.; and Onion Rots in Storage.

Mr. George Massee* has issued the second edition of his work on Diseases of Cultivated Plants. The director of Kew Gardens, Col. Prain, has well said in writing an introduction to the work: "So widely spread and, it may be added, often so intelligent is the interest now taken in the incidence and the dissemination of the diseases which affect cultivated plants, and at the same time so important is a proper conception of the causations and the treatment of these diseases, that a work which deals

*Bull. Ohio Agril. Exp. Sta. 121.
**Bull. Ohio Agril. Exp. Sta. 214.
*Diseases of Cultivated Plants and Trees. Macmillan Co., New York. 1910.

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with them cannot fail to be welcomed." There have been few English works dealing with the diseases of plants. The English translation of Tubeuf's German work still occupies an important field.

Between the interim of the work of the Rev. M. J. Berkeley and the present work, nothing as comprehensive has been produced. The various papers by the late H. Marshall Ward are excellent, but not comprehensive. Nor does the work of Dr. Cook pretend to be as comprehensive. The treatment of the subject by Massee may be seen from a glance at the contents of the book: Introduction; Primary and Secondary Causes of Disease; Epidemics; How Plants Are Infected by Fungus Spores; How Fungus Diseases are Disseminated; Facts not generally known; Wounds; Droughts; Injuries Due to Frost and Hail; Chlorosis; Injury by Smoke, Acid Fumes; Gas, etc.; Intumescences or Warts; Fasciation; Bacteriology of the Soil; Economic Aspect of Plant Diseases; Fungicides; Spraying; Injury Caused by Non-Parasitic or Undetermined Organisms; Phanerogamic Parasites; Mycorhiza; Fungi; Biologic Forms of Fungi; Parasitic Fungi Causing Diseases; Lichenes; Bacteria; Myxogasteres; Injuries Caused by Animals and Birds; Mites; Eelworms. Where the general subject of diseases of plants is discussed there is in the main a good presentation of the subjects discussed, but lacking frequently in important references. A large number of parasitic fungus and bacterial diseases of plants are treated in the remainder of the volume, many of them quite fully, many of them accompanied with excellent illustrations. The references to literature are abundant but mostly European. The work should prove useful to the student of diseases of plants.

The latest addition to the literature of diseases of plants is the work of Dr. F. L. Stevens and J. G. Hall* which was issued during June of 1910. These writers divide the subject of plant pathology into five groups, as follows:

1. Those caused by cryptogamic parasites, fungi, bacteria, and slime molds.
2. Those caused by parasitic flowering plants.
3. Those caused by animal parasites, insects, worms, etc.
4. Those due to adverse inanimate environmental conditions, light, water, soil, nutriment, etc.
5. Physiological diseases due to other internal derangement.

The work treats primarily of the diseases produced by fungi, bacteria and slime moulds. It was quite out of the question as the writer says, to study plant diseases before knowing something about the organisms causing the same. It was in its formative period between 1853 and 1870. The foundation being laid by Berkeley, DeBary and Pasteur's work on spontaneous generation. Some diseases were referred to in the Old and New Testament. The works of Frank (1880-1895), Sorauer (1874-1906), Kirchner (1890), Tubeuf (1904), Burrill (1873), Farlow (1875), F. Lamson-Scribner (1888), have greatly aided in a discussion of the problems of the horticulturist. Only a few American diseases had been described before 1880, and today some 525 are known, more than 250 of them be-

*Diseases of Economic Plants. MacMillan & Co. 1910.

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ing serious. After a consideration of these historical matters, there is a brief discussion of treatment of fungus diseases and the first use of Bordeaux mixture under the direction of Millardet of France.

The different diseases are discussed under various heads like general disease (soil diseases), diseases of special crops, pomaceous fruits (apple, etc.), drupaceous fruits (plums. etc.). The general characters only are given and these are ample. With the references to literature which are ample, the minute structure can be looked up. They have adopted common names using the technical generic name, "Bacteriose" for the shot hole bacterial disease of peach leaves, the dry rot of corn is called "Fusariose." It is a book that is safe to place in the hands of the practical man. The figures are excellent and will help everyone to recognize the disease.

Fungous Diseases of Plants is the title of a book by Dr. B. M. Duggar*, of Cornell University, published as a part of the Country Life Education Series published by Ginn & Co. This book appeared late in 1909, but was not distributed generally until 1910. The treatise contains a great deal of useful mycological matter, besides an account of the general nature of many diseases. There are numerous illustrations taken from reliable sources. The work is therefore a standard of its kind. The diseases are treated systematically, using the latest treatise on this subject, particularly that followed by European, especially German authorities. The book naturally contains a great deal pertaining to horticultural crops. It is much more exhaustive on these than the other treatise mentioned. While it is a book intended primarily for the college student, there is much in it of value for the practical horticulturist. The introductory chapters in part one give a great deal of general information on the following topics: Part I—Culture Methods and Technique; Isolation and Pure Culture Methods; The Development and Application of Culture Methods; Cleaning Glassware; The Priniciples and Methods of Sterilization; Preparation of Culture Media; Liquid Media; Solid Media; Neutralization of Culture Media; Present Method of Isolating Organisms. Part II—Technique of Fixing, Imbedding and Staining; Fixing; The Paraffin Process; Infiltration and Imbedding; Staining.

A most interesting summary of the botannical investigations carried on by the New York Agricultural Experiment Station is given by Prof. F. C. Stewart, the botanist of that station.

It covers a large part of the period of important pathological work done in the United States. The paper gives a very good account of the work with frequent references to the literature.

SUMMARY OF WORK OF NEW YORK BOTANIST.

FRUIT DISEASES.

A number of other practical papers have appeared during the past year, or the year previous, which are of special interest to the horticulturist and those interested in the planting of trees.

*Fungous Diseases of Plants. Ginn & Co., Boston, Mass. 1909.
*Rep. N. Y. Agri. Exp. Sta. 20.

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Prof. Brooks* of New Hampshire treats the subject "Some Apple Diseases" in some papers, calling attention to the need of information concerning the diseases of apples in that state. Discussing first the nature of plant diseases, the more important apple diseases in New Hampshire, such as apple scab, with some excellent figures. The fruit spot of apple (*Cylindrosporium pomi*) which has not been generally recognized heretofore. Its distribution is from New Hampshire to Maryland and Virginia. It is not so destructive as the scab, but often causes otherwise perfect fruit to go as seconds. The Baldwin apple is especially susceptible. The spots produced are deeper red on the colored surface of the fruit and of a darker green on the lighter portions. The spots are slightly sunken and they often change on the red surface to a brown or black. The spots are not unlike those produced on the cherry, excepting that these colored spores, chlamydospores, are quite common and tide the fungus over the winter.

Other diseases described are the fruit pit or Baldwin spot, the sooty-blotch and fly speck (*Leptothyrium pomi*). the apple rust (*Gymnosporium globosum*), black rust, canker and leaf spot (*Sphoeropsis malorum*), this disease of general occurrence in the state. This is the apple tree canker of New York, the bitter rot of the apple, (*Glomerella rufomaculans*), is of rare occurrence in New Hampshire. He thinks that the climatic conditions will prevent it from ever becoming a serious pest in that state. Crown Gall (*Pseudomonas tumefaciens*), said to be common on nursery stock. Fire blight (*Bacillus amylovorus*) is said to be of rare occurrence in New Hampshire. Prof. Brooks states that he has only seen the disease on apple trees that were closely adjacent to seriously affected pear trees. The European apple canker (*Nectria ditissima*) is not common in New Hampshire, as the black rust canker, but is more destructive. The blister canker or the Illinois canker (*Nummularia discreta*) depends upon wounds for entrance to the host's tissue, attacking the wood as well as the bark. and the fungus is common in some places. This bulletin should be of use to the apple growers of this state. This disease has lately been found in the Ben Davis in southwestern Iowa.

Prof. Wallace and Prof. H. H. Whetzel*, of Cornell University, have published a bulletin on Peach Leaf Curl in which they give an account of this troublesome disease. Since this disease is one of common occurrence where peaches are grown in this state, the bulletin should prove of interest. Apparently the Elberta is most affected. The disease is characterized by the abnormally swollen, thickened, and distorted leaves. The disease also occurs upon shoots and frequently destroys them. The disease is produced by a fungus, *Exoascus deformans*. related fungi occur upon plum, producing the plum pocket, the witches broom of the cherry, birch. etc. The suggestion is made, as others have done before, that the low temperature and moist atmosphere are inclined to affect respiration upon the leaves out of proportion to the absorption of water by the root from a relatively warm soil, consequently the leaf tissue becomes abnor-

*Some Apple Diseases. Bull. New Hampshire Agrl. Exp. Sta. No. 144.
*Peach Leaf Curl. Bull. Cornell Univ. Agrl. Exp. Sta. No. 276.

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mally gorged with water, causing a succulent watery growth less able to resist the attacks of the fungus.

The old subject of fire blight of pears, apple, quinces, etc., receives treatment from Whetzel and Stewart.* This paper is well illustrated with figures showing the claw from a bee's foot with blight bacteria on and about it to show the relative size. Then the authors give an account of the injury done to branches, fruit, blooms, and trunks of the trees, etc. The bulletin emphasizes the importance of insects of various kinds in transmitting the disease. The authors recommend the following treatment to destroy all sources of infection that is. clean out all cankers in the apples, pears. and quinces, cutting well into the healthy tissue and removing the diseased bark; disinfect the cut with corrosive sublimate solution, 1 to 1000 of water; make a regular inspection of every tree in the orchard at least once a year during the growing season. Break out all blossom spurs that show the disease and remove them form the orchard; remove all water sprouts from the trunks of trees; cut out all blighted twigs. In this connection the admirable Mr. D. H. Jones† after a discussion of the history, cause and a discussion of the appearance of the disease on the twig, fruit, limb and trunk, takes up the dissemination of the disease. Under this head two types of inoculation are considered: *a*, blossom inoculation; *b*, twig inoculation. Insects, according to Mr. Jones are the principal means of dissemination for the first type. This was first demonstrated by Waite of the U. S. Department of Agriculture. Twig inoculation may be brought about in various ways. The sprouts on the trees were covered with plant lice. From the aphids on the living and dying twigs he obtained cultures of the organism. On the injury this insect does to the plant, Mr. Jones says:

"Every horticulturist is more or less familiar with the aphid and its injuries to trees. The aphid is a sucking insect. It obtains its food by puncturing the tender bark of young shoots and leaves with its proboscis through which it sucks the plant juice. It reproduces very rapidly. Hitherto it has been thought that the extent of the damage which it caused was confined to the direct injury done to the plant by depriving it of sap and the malformations caused by the irritation set up in the area attacked. Our observations this season, however, have proven conclusively that the great majority of the new infections of twigs by the blight after the blossom season has closed are due to the transmission of the germ from diseased areas by aphids."

"From our observations we have concluded that practically all the fresh nursery infection, all the water-sprout infection, all the sucker infection, all the twig infection other than that due to blossom inoculation, on the apple trees was due this season to inoculation by the aphis, and we infer from this that probably it is usually so. This season the aphis was very plentiful and the blight was proportionally so. Possibly the periodic bad outbreaks of blight in the apple are coincident with a plague of aphids such as occurred this year."

†Bull. Dept. of Agrl. Ontario. No. 176.

*Fire Blight of Pears, Apples, Quinces, etc. Bull. Cornel Univ. Agrl. Exp. Sta. No. 272.

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He also concludes that the fruit, bark boring beetle, *Scolytus rugolosus*, is one means of spreading the blight in both apple and pear. The blight organisms were also found on these insects. The writer of this has long held that insects of various kinds have been the chief means of scattering the disease. It would seem from the careful work of Mr. Jones that the aphids should be removed.

A very instructive and valuable bulletin on winter killing of twigs, cankers and sun scald of peach trees has been prepared by Prof. F. M. Rolfs.* The killing back and gumming of peach twigs, cankers of the limbs and sun scald of the limbs and trunks is a common condition in peach growing sections of the country. Prof. Rolfs describes a parasitic organism as the cause of this in many cases. Fungus threads are usually associated with this trouble and cultures made from the diseased tissues constantly develop a fungus known as *Cytospora cincta* which Rolfs has shown is connected with *Valsa leucostoma*. The perithecia develop abundantly on the limbs and trunks, but rarely on twigs. The spores of both forms are washed down by rains and probably carried from tree to tree by insects and birds. Prof. Rolfs says in regard to infection:

"Infection usually takes place at a bud, but wound infections also occur. A spell of warm weather during the late winter or early spring months, which starts the sap, followed by a freeze, appears to render the tissues of the tree favorable to the growth of this fungus. Twigs and branches are often killed back, and even large limbs are severely injured by it. Infections on the branches often form rough black cankerous wounds. Such wounds usually form enlargements of the branches near the injured points. Infections on the limbs and trunks form large areas of dead tissue, known as 'sun-scald.'"

"The age and physical condition of the tree have a marked influence on the extent of injury done by the fungus. Young, vigorously growing trees are not seriously injured by it. On the other hand, old neglected trees, especially those standing in sod, are sometimes permanently injured. The real source of danger lies in its attacks on weakened or injured trees, especially those injured by frost. The semi-parasitic nature of the fungus enables it to live indefinitely on the dead tissues of both trunks and branches, where it becomes a center of infection for the weakened tissue. It quickly invades the tops of winter injured trees and frequently aids materially in their final destruction."

Rolfs has made cultures of this fungus and has shown that the fungus on peach may be cross-inoculated on the plum, apricot, red cherry and the wild black cherry. The plum and apricot cultures more aggressive than those of other prunicolar plants.

In recent years a number of interesting papers have been published on the development of disease resistant varieties of plants. There are two ways of dealing with these fungus parasites, *a*, treatment with some fungicide, *b*, to plant varieties which are immune or relatively immune from a disease. Locality, soil, and climate are important factors. The enormous loss to our cultivated crops from fungus diseases has been brought out very strikingly in a paper by Prof. G. M. Reed.* Common Grass

*Bull. Mo. State Fruit Experiment Station No. 17. May, 1910.

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Rust, *Puccinia graminis*, damaged wheat in 1891 (Galloway) to the extent of $67,000,000. Late Blight of Potatoes damaged the New York crop of that plant in 1904 to the amount of $10,000,000 (Stewart). Peach Leaf Curl damaged the peach in the United States to the extent of $2,335,076 (Pierce) in the year 1900. Prof. Reed gives a very good discussion of this subject in the above paper and adds some additional matter in a paper The Mildews of the Cereals.* Hybrids may at times be more resistant than one of the parents. Orton* found that a hybrid between the citron and water-melon is resistant to wilt. Biffen* has attempted to show that Mendel's law of inheritance applies in the transmission of disease resistant varieties. Prof. H. S. Jackson* discusses the subject from its broad aspects. He says:

"We must first get a definite idea of what is meant by disease resistance in plants. We must distinguish it from hardiness. Hardiness is a general term. A hardy variety, as generally considered, is merely one that is less susceptible to cutting frosts, drought, or extreme changes in temperature, in short, one that is capable of withstanding adverse climatic conditions in a state of health. A disease resistant variety for our present purpose, may be defined as one that shows resistance to the attack of a specific disease due to a specific organism."

In giving reasons why resistant varieties should be developed, spraying is not always practical for the man who has a few trees, although profitable; labor is an important matter and it cannot always be depended on. Then there are many diseases which cannot be sprayed, such as soil rots and wilts. For the production of resistant varieties he suggests the following: (a) Selection of individuals, (b) selection of varieties, (c) hybridization followed by selection of varieties and individuals. The well known Phylloxera resistant *Vitis riparia* is cited as an illustration of disease resistant variety which was largely planted in Europe to resist the attack of the Phylloxera. One of the difficulties met in breeding varieties is the fact that the fungus may become more virulent. Prof. Jackson cites the case of apple scab. "A prominent apple grower of Kent County, Delaware, who has practiced spraying against apple scab for nearly twenty years, recently expressed the opinion that the apple scab was much harder to control now than when he began to spray, and said that he believed it was due to variation on the part of the scab organism in the direction of greater virulence. The history of the coffee leaf disease in Cylon is also in support of this objection."

POTATO WART DISEASE.

In another part of this volume I have referred to the potato wart disease and the danger of importing this important fungous disease in the United States. During the past year, Prof. H. T. Gussow* has issued a paper giving the more important characters of the disease. Mr. W A. Orton and Miss Ethel C. Field, of the United States Department of Agricul-

*The Development of Disease Resistant Plants. Missouri State Board of Horticulture. 1908.
*Bull. Torrey Bot. Club. 36:353.
*Science II. 25:228.
*An address before the Mass. Hort. Soc. March 14, 1908.

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ture, also gave an account of the disease with references to the literature and measures to be adopted in preventing it.† The disease is characterized by producing big dark warty excrescences, sometimes as large as the tuber itself, which appear on its sides or ends. The growth consisting of coral-like, or more or less scabby excrescences or nodules, similar in appearance to the well-known crown gall of apples. Later the tubers become wholly covered by this growth, these lumps are of irregular size, later the tissues become broken down into a brownish pulpy mass and give off a putrifactive odor. This broken down material consists of the spores. The organism causing this disease was discovered in 1906, in Hungary, and is called *Chrysophlyctes endobiotica*. The fungus consists of a naked mass of protoplasm, a plasmodium. During the summer this plasmodium forms a spore case (sporangium) in which the spores occur. Infection usually takes place at the eyes. The disease occurs in Germany, Hungary, Scotland, Ireland and in Newfoundland. There is great danger of importing this pest into the United States, as there are no laws governing the importation of potatoes.

WOOD DESTROYING FUNGI.

Dr. Reginald Buller of the Manitoba University gives a good account of "The Destruction of Wood by Fungi."* There is a brief discussion of the animals destroying wood, like the ship worm, the Crustacea, white ants, and beetles. As yet no bacteria destroying bacteria have been described. The chief wood destroying agencies at work are fungi belonging to two groups, the sac fungi, and the toadstools and bracket fungi. The paper contains a good resume of the structure of fungi and the early theories of Theodore Hartig, the father of Robert Hartig, the well known forest mycologist, and likewise an account of his work, and others of more recent times. Then he gives an account of the destruction of paving blocks by *Lentinus lepideus*. This fungus causes the wood to become red and spongy when wet, it shrinks and cracks, becomes brittle and friable. The paper also discusses the Great Scaly Polyperus (*Polyperus squarrosus*) and the common vari-colored polypore (*Polystictus versicolor*). Then he discusses the methods now used to preserve wood, like the Hasselman method, and the creosoting method. Another interesting paper to the biologist is the one on "The Function and Fate of the Cystidia of *Coprinus atramentarius*, together with some general remarks on Coprinus Fruit-bodies" is by the same author.‡

He concludes that, "The gills of *Coprinus atramentarius* are of great width and of extreme thinness, and consequently are very flexible. Numerous long cystidia stretch between and connect adjacent gills, the general surfaces of which thus become separated by an interlamellar space about 0.10 mm. wide. The cystidia serve as props, firstly, to keep the gills from touching one another by their general surfaces during the development of the spores, and, secondly, to provide sufficient interlamellar

*Bull. Sept. Agrl. Central Exp. Farm, Canada. No. 63.
†Wart Disease of the Potato. A dangerous European Disease Liable to be introduced into the United States. Cir. U. S. Dept. Agrl. Bur. Pl. Ind. No. 52.
*Reprint from Science Progress. No. 11, Jan., 1909.
‡Annals of Bot. 24:613.

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space for the escape of the spores from between the gills during thir discharge."

"In the genus Coprinus there are at least two methods of providing for the maintenance of interlamellar spaces: (1) the cystidia method, and (2) the swollen gill-margin method. The former is employed by *C. atramentarius, C. narcoticus, C. stercorarius, C. fimetarius, and C. niveus,* and the latter by *C. comatus, C. sterquilinus,* and *C. plicatiloides.* The three last named species do not have cystidia on their hymenial surfaces."

Auto-digestion of the cystidia has been observed in eight species of *Coprinus.* It seems very probable that self-destruction in connection with spore-liberation is the rule for cystidia wherever they occur in the Coprini."

"Probably, throughout the Coprini, cystidia have a mechanical function in that they serve to prevent opposing hymenial surfaces from touching one another during the development of the basidia and spores. However, if so, this function is carried out in slightly different ways in different species."

REPORT OF DELEGATE TO NEBRASKA.

T. C. TANNER, PALO.

In reporting the meeting of the Nebraska Horticultural Association held at University Farm, Lincoln, January 17, 18, 19, 1911, will say they had a very interesting meeting, with a very good attendance.

Their display of apples was good, nearly three hundred plates, mostly from the southeast corner of the state. They are doing considerable experimental work, testing new varieties of fruits, ornamental and forest trees, and the smudge pots. All that gave their experience were in favor of using the smudges.

The florists held their meeting in connection with the Horticultural Association. They had a fine display of plants and flowers, and gave some very interesting talks on the propagation, care, and selling of plants and flowers.

Wednesday there was a session with the Forestry Association that brought out some fine papers and talks on timber growing. One especially, was by Mr. A. J. Brown, on the identification of the catalpa, showing specimens of seeds and wood of the different species.

Mr. Henry C. Smith of Falls City gave a very interesting talk on "How We Grow Apples." He described how he planted and took care of his sixty-five acre orchard planted fourteen years ago. He recommended clean cultivation and thorough spraying; does not want a weed or any grass in his orchard. He now has twenty thousand bushels of apples in cold storage.

Nebraska is surely coming to the front as a fruit and grain state. Sections that a few years ago were considered nothing but a desert, good for nothing but prairie dogs and jack rabbits, are now settled with a wide-awake class of citizens.

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REPORT OF DELEGATE TO THE WISCONSIN STATE HORTICULTURAL SOCIETY MEETING.

G. D. BLACK, INDEPENDENCE.

Your delegate was able to be present at the opening session of the annual meeting which was held at Madison in the City Library building January 10 to 12. There was an average attendance of about 50 present most of the time during the three days' meeting. We noticed that a majority of those present were comparatively young men, which augurs well for the future of Wisconsin horticulture.

The society receives an annual appropriation of $8,000.00 from the state which gives them the necessary funds for establishing and maintaining a number of demonstration orchards in addition to their regular trial orchards in different parts of the state. These demonstration orchards are mostly planted on land leased by the society for a long term of years. They serve as object lessons to the people of the locality in which they are situated. They are planted, cultivated, sprayed and pruned by practical orchardists. An accurate account is kept, each orchard being charged with the expense of maintaining it. As most of these orchards are young, having been recently planted, the account has all been on the debtor side until the past season, when $900.00 was received for apples sold from one of these orchards. They estimated that 3,000 visitors had been at the Wausaw orchard when demonstration work was in progress.

Much interest was manifested in the papers and discussions on the lime-sulphur spray mixture. Professor L. R. Jones gave the following formula for making the self-boiled mixture. Put 32 lbs. of good unslacked lime in a 50-gallon barrel, and only just cover with water, then pour 32 lbs. of sulphur on the lime, and keep the mixture well stirred with a strong paddle until lime is all slacked. Add more water gradually while lime is slacking, so as to keep lime from burning, but not enough to drown it. After lime is all thoroughly slacked, add water enough to fill barrel. This can be kept as a stock solution and is sufficient for 200 gallons of spraying mixture. The addition of 3 lbs. of arsenate of lead to each 50 gallons of spraying mixture makes it an insecticide, as well as a fungicide.

The entertainment committee made it their business to see that the delegates from other states were not left alone or permitted to feel as strangers in a strange place. We were all entertained in a right royal manner.

REPORT OF DELEGATE TO SOUTH DAKOTA.

MINNIE AVERY, COUNCIL BLUFFS.

The 22d Annual Meeting of the South Dakota Horticultural Society was held in Pierre, the capital city. The weather was mild and pleasant; in fact we were told that the blizzards are becoming less severe with the advance of horticulture and agriculture.

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The leading horticulturists of the state were there, filled with zeal and enthusiasm for the improvement of their state.

A long and earnest debate on the value of tree planting was listened to with great interest. The crops are much improved by shelter brakes, and they can raise more on 155 acres with the other five set out to trees than they can on the whole 160 without trees. The subject of asking the legislature to offer a bounty for tree planting was discussed.

The society has a fruit list, which is revised from time to time. The different varities of fruits are discussed, and those which have proved successful for certain localities are listed, and those which are doubtful are so marked. Some fruits have been successfully raised in one part of the state, and have proved a failure in other parts. This list is of great value, as it gives to the people the results of the experience of those who have pioneered in this line. The Wealthy seems to be regarded as the best apple for the north and middle states as a winter apple, while with us it is a summer variety.

The nurserymen of South Dakota have a well defined theory that it is to their best interests to encourage as many of its people as possible to engage in horticultural or agriculture pursuits, and to instruct them along these lines. The prosperity of the state is enhanced in every avenue of business in proportion as these persuits are followed with intelligence. In this age of progress much time and thought is put on an education which will prepare one to successfully cope with the varying conditions of soil and climate.

In South Dakota the governor and many prominent men take great interest in the Horticultural Society, both as regards its high aims and aspirations for the betterment of all that it stands for, and its social life as well.

It is the custom of the South Dakota Society to procure a speaker of renown to give lectures on topics of common interest to all, which adds much to the interest and instructiveness of the meetings. At this meeting Prof. N. E. Hanson delivered illustrated lectures on his trips around the world. These trips have been in the interests of the United States government, the object being a search for hardy seeds for the northern states. It is hoped some day to find alfalfa hardy enough for that climate. He also showed many curios which he had brought home with him.

One of the enjoyable features was an original poem on "The Huckleberry," read by Mr. Robinson.

The banquet in the new seventy-five thousand dollar Methodist church, which was just completed and ready for dediction, was a most enjoyable occasion. The ladies of the church served the dinner, and the members enjoyed a social time with toasts and good cheer. Governor Vessey attended the banquet, and was the first called on to deliver a toast. His subject was "South Dakota," and he did it full justice in a rousing speech.

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REPORTS OF DELEGATE TO MISSOURI MEETING.

C. O. GARRETT, ADELPHI.

Your delegate had the pleasure of meeting with the Missouri State Board of Horticulture at Columbia where the annual sessions are held in connection with the short course work in various branches at that University.

The attendance was large and the event was designated as "farmers' week." To care for and accommodate the students and visitors (about 3,000 in all) kept the commercial club and citizens busy.

I will mention the papers and addresses of special interest to our people.

A splendid talk by Prof. Howard on preparation and planting of an orchard. His final statement that it requires "just common honesty to plant a tree" is surely correct.

Prof. Whitten recommended summer pruning especially where fruiting is desired, also advised using strong one year whips when planting commercially.

President Hitt's talk on co-operation in the fruit business, and as practiced by a central association in handling the immense output of fruit in the Ozarks was very interesting. The association at that point handled last season's crop for a commissian of 2 per cent and nearly all growers in the Koshkonong district sold their fruit through the association. Their reputation being well established very little fruit is consigned, but nearly all of it is sold on track, the guarantee of the association being back of every car. In order for co-operation to be complete and effective all must get in line and then make uniform pack and use uniform package.

A great deal of time was taken up in the discussion of orchard heating; some reported favorable results and some were like Mr. Starks, said we Iowa Horticulturists were "Doubting Thomas's."

In a great many cases Missouri orchardists are fitting out with orchard heaters, some are making home smudge pots, using stove pipe cut in two and putting in cement bottoms. reinforcing with cross wires, making a cheap serviceable pot, using crude or fuel oil. Some orchardists have tried coal burners, but now prefer crude oil for the reason it seems better adapted to emergency work.

I was more impressed with the reports of many fruit growers on their success in spraying, arsenate of lead being generally used as an insecticide, while Lime-Sulphur and Bordeaux were both recommended by users who have had favorabe results. The Lime-Sulphur having the best of it as far as used, though those having good results with Bordeaux will be slow to change. It seemed understood that the application of Bordeaux after the petals fall is the one that russets the fruit, some advise the use of Lime-Sulphur at that spraying to avoid the russeting.

Mr. Lowemiller, of Parkville, who uses Bordeaux and Aresnate of Lead (two applications) last year sold 2,500 bbls. of apples. and stated that 90 per cent of his apples were free from codling moth, and scab, and good enough to grade and barrel. Such reports as this were common

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among growers who are persistent in the care of their orchards in pruning, cultivation and spraying.

Prof. J. C. Whitten gave a talk on varieties of apples. It is not a question with Missouri growers how many varieties, or what can they grow, but just what variety does best in its particular locality and for its particular purpose. I call it specializing on adaptability of varieties. For example, the Neosho berry growers have hundreds of acres of strawberries, and yet 90 per cent are one variety, viz., Aroma. It comes nearest filling the requirements for growers there.

Mr. Dunlap, of Savoy, Ill., gave a talk with illustrated slides on subject of spraying and spray materials that was practical and to the point, a line of information that would be of value to every horticulturist in the state of Iowa.

I feel that the time was well spent and trust some of the points above mentioned will be of interest to our society.

REPORT OF DELEGATE TO ILLINOIS

W. T. RICHEY, ALBIA.

The Illinois State meeting was held in the Agricultural building at Urbana, Illinois. The State Schools and Experinmental Station being located at this place making it very desirable for such a meeting.

The meeting was called to order Wednesday morning, February 8th at 9:00 A. M., by the Vice-president. The program was of interest from start to finish, and those assigned to topics seemed to understand their subjects well. One of the topics that should receive special mention was "Landscape Gardening". This lecture was illustrated with colored slides, and was especially fine, as was also "Flowers for the Home," by Prof. H. B. Dorner, of the University of Illinois, which was also illustrated in the same way.

Another very excellent paper was given by Mrs. Senator Dunlap, on the possiblities of the country home. This paper was excellent. How we wish it could be published in every paper throughout the land, proclaimed from every school house, until it reached the ears of the parents of our country.

"Orchard Heating" was discussed under Illinois conditions, with the decision that while it might pay the specialist, it would not be practical in a general way. Of course the spraying was not forgotten, and was considered practical. There was a number of power sprayers on exhibition in one of the buildings, demonstrating the power and usefulness of the different machines.

There were two papers on pruning. One on the orchard and one on the grape. These were also illustrated.

The apple show was not very elaborate. but some very fine specimens were shown.

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The truck gardeners were not forgotten in this meeting, and some excellent papers were given along these lines.

The florists were in session at the same time, and the "Flowers Show," was simply grand. The attendance at these meetings was fairly good, and the Illinois people did all in their power to make it a success, and to make the delegates and those from abroad feel that they were welcome. They entertained their guests in fine style at the Beardsley Hotel. And we feel that our Society might profit by following along some of the same lines, especially by not only interesting the fruit growers and the florists, but also the gardener. Also by the illustrated lectures, thus making everything practical.

Another commendable feature was the Horticultural Instutute, or "Short Course," that convened the week preceding the Horticultural meeting. This was very instructive along different lines of horticulture and should receive general commendation of the State Society.

RECIPROCITY BETWEEN SCION AND ROOT.

EDSON GAYLORD, NORA SPRINGS.

The affinity between scion and root has long been well known by our leading tree propagators and tree dealers, but for some reason not fully known to the writer it has up to date been as a hidden mystery. By request, I have been asked to write a few lines bearing on this question. I have consented to do this with no little reluctance on my part, knowing it is a matter that our scientists should have taken up many years ago. If this matter had been thoroughly investigated and put to a practical use by our tree propagators over this great Northwest, our fruit growers would have been at least twenty-five years ahead of where we are today, besides the saving of millions that have been spent for tender trees.

So far as I understand, the matter is like this: That all trees grown on their own roots will commence to change their character at once when their tops are removed and some other variety is made to grow on the original trunks and roots.

This being the case it shows us the importance of protecting the roots of our trees where they have been started on tender roots. If the new top put on is hardy, it will take a few years for the hardy top to transform the trunk and tender roots to hardy ones. This brings up a very important part of my subject. That is: What is the best course to follow when we wish to grow half hardy varieties, even if we have such started on hardy stock? This is the question I am anxious to have answered by any or all of our scientists. What is the best way for orchardists in the Northwest to do? It looks to me to be something like this. First, set perfectly hardy trees grown on their own roots; let them grow till they are four or five years old, six or seven years might be still better. The longer they are thus grown, the more enduring they

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will be found, and the longer one delays grafting the more sure he may be of having the best and latest varieties. It appears to me that it might be well to retain more or less of the lower limbs of the original stock to help prolong life and give vigor to the tree.

So far as I have learned by my experience and observation, the Northwestern Greening, the Winesap and Patten's Greening are poor trees to make their own roots. Many of these two Greenings are found blown over or badly leaning, while the Hibernal, Virginia Crab and some others are seldom found blown over or seriously leaning. What we are most anxious to learn now it what varieties make their own roots best.

REPORT OF DELEGATE TO THE AMERICAN POMOLOGICAL SOCIETY.

WESLEY GREENE, DAVENPORT.

Owing to delay of trains the journey to the biennial session of the American Pomological Society required three days and nights, instead of the usual schedule of 58 hours. The meeting was held in the music room of the Tampa Bay Hotel. About 100 delegates were present from twenty-six states and territories. The program covered a wide range of pomological topics, but most of the time was devoted to the consideration of sub-tropical fruits.

The fruit exhibit was shown in the Woman's building on the State Fair grounds, a short distance from the hotel. Most of the displays were staged as county exhibits, or as commercial advertisments under the management of land companies, and were not in competition for any prizes offered by the society. These exhibits were under the supervision of the Tampa Board of Trade, and were a part of the general festivities offered for the entertainment of tourists and members of the society while in Tampa.

Hillsborough, Polk and Lee counties supplied most of the exhibits. Cuba showed some very good citrus fruits from Santiago. California was represented by a large collection of Persian walnuts, and the Gulf states by a fine display of pecans.

Virginia and North Carolina showed apples of fine color from the mountain districts.

The Florida Citrus Exchange exhibited some well-packed boxes of oranges and pomelos that showed the care taken by this association in grading and packing citrus fruits.

The exhibit of the United States Department of Agriculture was very instructive and showed the effect of blue mold on different packs that was at least suggestive to the grower that if he handled the fruit carefully his loss would not be so large from this fungus.

Ripe strawberries and garden vegetables were given prominent places in many of the exhibits, and showed quite clearly how mild the climate of Southern Florida was in February.

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On Saturday the members of the society were the guests of the Tampa Board of Trade and spent the day on the bay and in visiting orange and pomelo groves in Manatee county. On Monday a trip was taken by rail to Tarpon Springs to see the sponge industry in that locality.

The orange industry in Florida is in much the same condition as is that of the apple in Iowa. You can see groves in every condition imaginable; some in fine health that are giving a good profit from the fruit sold, and others that have been abandoned or so badly neglected that they are not profitable.

I was much interested in the efforts of some growers to improve the orange industry in the state and make it more profitable for those engaged in it. After considerable time had been spent in studying the methods used by the California growers, they organized the Florida Citrus Exchange, an organization for the sale of the fruit owned and controlled by the growers. The duties of the grower are two, namely, to produce the very best fruit he is capable of producing in his grove, and to gather it with the utmost care so it will keep for the longest time without deterioration; next, to elect directors of his association who are skilled in matters of handling fruit, and who are honest and loyal to him and his interest. The board of directors control the packing of the fruit of the association, and elect a secretary, who is the executive officer or manager and it is his duty to enforce the orders of the board. The board of directors elect one of their number a director in the sub-exchange. It is the duty of the sub-exchange to forward the fruit to the exchange and to receive drafts for same. The directors of the sub-exchange elect a secretary, who is its executive officer or manager, and also one of the board to be a director in the exchange. The exchange sells all the fruit received from the sub-exchanges and sends the draft for same to the sub-exchanges, and the secretary of the sub-exchange sends it to the secretary of the local association, who gives it to the grower. A complete record is kept of every car under an exchange number of the fruit shipped. A complete list of shipments and sale of fruit is posted in the office of the manager of the association so that each member may inspect it daily, if he cares to do so--can see whose fruit was sold and the price paid for it. A percentage is taken from the amount sold by the exchange and the sub-exchange to pay the expenses of marketing the fruit. The exchange has a very complete organization for the sale of fruit, having representatives in all the larger cities in the north to which citrus fruits are shipped.

I cannot take any more space to go into the details of this organization of the growers for the sale of their oranges, and will close by giving a brief description of the care used in packing the fruit under rules formulated by the association. A picking crew consists of twenty-one men; sixteen pickers, four inspectors, and a foreman. All are obliged to wear white gloves while at work. Pickers are instructed how to clip the stem close to the fruit and not cut the orange. The gloves prevent injury to the fruit by the finger nails of the pickers and in-

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spectors when handling it. No picker is allowed to empty the oranges from the picking basket into the field crate. The picking baskets are of rattan wicker work lined with white canvas that does not reach quite to the bottom of the basket. When the basket is full of oranges, the picker carries it to the nearest field crate. Then one of the inspctors takes the oranges from the picking basket one by one, examining it carefully as he places it in the field crate. The inspector is furnished a book with blanks in which are entered, date of picking, name of grove, or name of owner, name of picker, and number of long or short stem oranges or other defects, and the name of the inspector. When the field crate is filled, the inspector attaches this memorandum to the crate. A chief inspector examines the work done by the other inspectors, whose names are found on the tag in the field crates. The tagged boxes are then placed on wagons equipped with springs and taken to the packing house.

The oranges are then emptied on a sorting table having a slight decline down which the oranges roll. Inspectors stationed on each side of the sorting table examine the oranges for defects, while a checking clerk holds the ticket placed in the box by the field inspector; when the oranges have rolled past the inspectors, it is filed away as a record for or against the field inspector. All defects on oranges found by the sorting table inspectors are entered on the tag before it is placed on file. From the sorting table the oranges roll onto a canvas belt which conveys them to the soaking tank. The soaking tank prepares the oranges for the washing machines, and also shows the light fruit, which is removed from the tank by an inspector stationed there for that purpose. When the fruit reaches the end of the soaking tank, it is taken by a corrugated rubber belts and is fed automatically to the washing machines where the oranges are gently scrubbed with brushes while tiny sprays of water play on the oranges. From the washing machines, the oranges are automatically conveyed to the drying machines. After leaving the drying room, the fruit is automatically delivered to the grading belts made of wide, white canvas, on each side of which are stationed inspectors looking for their particular grade and for culls. When an orange is found for the grade he is selecting, it is placed on another belt which conveys it to the sizing machine from which it is delivered into a bin for each size, to be packed under that brand. At each sizing machine is another inspector looking for culls.

Each orange must pass seven inspectors before it is wrapped with paper and packed in a box for delivery to the buyer or consumer.

These oranges were so carefully and firmly packed that a box without a cover could be stood on end and not an orange fall from it, and could be shipped without showing a bruise or other defect from the method of packing used by this association.

I am indebted to W. C. Temple of Tampa, president of the Florida Citrus Exchange, for the information relating to the organization and management of the exchange.

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The thought I would impress on the Iowa apple grower is that if Florida can organize such a complete system of disposing of the orange crop that will bring success out of failure, and place the orange industry on a sound commercial basis, why cannot the apple growers in Iowa do as well?

What we need in the apple industry in Iowa is more thoroughness in our work. We must grow clean, perfect fruit and then market it in a businesslike manner and then success will be certain.

ARTISTIC POSSIBILITIES IN FLORAL WORK.

ELMER E. NORDWELL, FORT DODGE.

In taking "Artistic Possibilities in Floral Work," as the subject of my paper this evening, I was aware of the fact that some very excellent articles along this same line have appeared in one of our trade papers, but believing that too much could not be said regarding it, I decided to jot down a few observations of my own on the subject. It is rather interesting to look back a few years and see the style of work sent out at that time, work that was considered almost perfection by the great majority of flower buyers, but which now would be considered impossible, from an artistic point of view, by those same people. And yet even now one can see that same kind of work turned out, that same stiff, formal jumble of flowers, which they are pleased to call a design. I do not believe it would be unfair to say a large per cent of the present day dislike for set pieces is due to the inartistic work sent out by some florists. No doubt some of you have tried time and again to impress on a customer that a design would be a very appropriate remembrance for a departed friend, only to have her remark: "Oh, my no, they are too stiff and funereal." But should you succeed in influencing her in your direction, and then send her something with a little touch of the artistic and a little individuality to it, you generally find her back the next time wanting the same thing or something like it. As a rule, a customer thinks she is getting more for her money when she buys a set piece than when she a buys a bunch of loose flowers.

Possibly you say that everyone is not capable of turning out artistic work. I dare say there is not a person but what has some artistic ability which a little practice will help to develop. He may not be able to make a piece like some other florist—that isn't the idea—but he can make something similar, and put in just enough of his own originality to make it different. Don't be afraid to put some individuality into your pieces, as you will find that the public will notice it every time. There is hardly a piece that is not susceptible to artistic development of some kind, if given a little thought. One may accomplish it either by a simple deviation from the general outline, or by a simple change in the ordinary run of color schemes, taking care not to take too many liberties with these same schemes.

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As a simple illustration of what we are called upon every day to do, you might take the pillow as an example. And yet, though simple of outline, the pillow presents some difficulties in artistic development owing to the fact that your customer invariably demands some kind of inscription placed upon it. How often do you not see a pillow with the name plate set directly in the center with a row of roses bordering it, then another set of roses, and so on till the design is completed. There are a number of ways of avoiding the formality of this design. One may make an oval plate in the center, or to one side working your roses or other flowers loosely in each corner, or you may make your lettering foundation to represent a ribbon scroll running diagonally across the pillow, working your other flowers in so as to appear as if coming from underneath the scroll to the opposite corner. Then again the inscription may be placed at the lower right hand corner, and the decoration loosely at the upper left hand corner. Still another pretty way is to decorate the pillow with a loose bunch of roses or other flowers with the stems extended slightly over the lower right hand corner, and placing a ribbon with the inscription over the stems so as to appear as holding the bunch in place.

The color combinations available in making a pillow are too innumerable to mention, but as an illustration we will take one example. The pillow was made nearly solid with lavender asters, and decorated with a lose bunch of pink roses tied with a pink ribbon, with its inscription in good letters. This was a beautiful combination, the pink rose buds and ribbon giving the life so necessary to a good piece of work. One will be surprised at the many different color schemes and forms of arrangements available in a floral piece if only a little thought is given each one. If there are any pieces hard to develop artistically, they are those on bases. The designer is apt to make the base too solid or too even. Very often one sees a base made so as to appear as a separate piece, instead of being a part of the whole design.

Taken as a whole, there is nothing that catches the eye of the public so quickly as a well executed piece of floral work, and every florist should strive to put some individuality into his pieces. If he does this, the public will soon be able to recognize and pick out his work among a large display. The advance along the line of artistic floral work has been very marked during the last few years, and the change from the solid to the loose airy effect is indeed welcome.

COLOR EFFECTS WITH BEDDING PLANTS.

GEORGE S. BALTHIS, DES MOINES.

The above subject is one which appears to have been overlooked by a large number of florists, as much of their work has proven to me of late. It tends to show, however, how much thought and study has been made of the characteristics in regard to the growth of the plants but not in the blending of colors.

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In summer bedding there are several things which must be considered without regard to the colors to insure success. We must know about the height each variety of plant will attain in order to insure symmetry in the appearance of a bed. Attention should also be paid to the nature of the leaves, especially in carpet bedding. It is an easy matter to so mix alternanthera and coleus as to spoil an excellent design. It is almost impossible to arrange alternanthera on the inside of a coleus bed and make it look well. In the so-called carpet beds it is very seldom that flowering plants can be used with any degree of satisfaction. Not very long ago, I noticed a good design spoiled because sweet alyssum was used and in the gardener's endeavor to keep it as low as the alternanthera, he had necessarily pinched off the tops, which would have flowered, and the space was green where it was intended to be white. As the color of a plant often changes to a certain extent when moved from the greenhouse to the garden, we should have a complete knowledge of not only what the color is but what it will be.

If there are several beds to be planted in a certain space, we ought not only choose colors which harmonize within a single bed, but also between the beds as a whole. For instance, a bed of red geraniums bordered with Madame Salleroi geraniums looks better near a bed of yellow cannas than red ones. If the red cannas would be used, the individual beds would be satisfactory, but there would not be enough contrast between the beds. One of the best flower beds I ever saw was planted as follows (naming from the center out): First, Robusta cannas (red); second, Florence Vaughn cannas (yellow); third, Salvia, Mrs. Page; fourth, coleus, Golden Bedder (yellow), fifth, alternanthera Brilliantissima. In every instance the contrast was good and the colors were bright and harmonized perfectly. An example of a smaller bed might be as follows: A center of King Humbert cannas bordered with any good red alternanthera.

Having mentioned a few instances of good color combinations, I will now describe some which I have seen and consider quite undesirable. In one of the parks in this city, I noticed a very good bed planted with King Humbert cannas in the center, Salvia next, and the coleus, John Pfister, as a border. How much better it would have looked, however, had there been some bright color, such as yellow or white to separate the different shades of red. I have also seen beds similar to the above except that they were intended to be all yellow, but owing to the different shades of yellow it would have looked much better had there been some darker color to separate them. One of the most unsatisfactory pieces of planting in regard to the blending of colors is to be seen in a very prominent place in this city. There we can find red and pink geraniums together with some blue ageratum. A worse combination would certainly be impossible to find. On the other hand, how much more beautiful would a simple bed of red geraniums bordered with sweet alyssum or of white geraniums bordered with blue ageratum look.

In planting a floral garden, or even in planting a few beds on a large lawn, there are several points which may be considered in the planting

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of either the foreground or background. If, when planting the background, you wish to give the grounds a larger appearance, plant such colors as blue, pink, orange, deep red and the like, while if the background is to appear closer, any bright color such as scarlet, white and yellow will have the desired effect. I first noticed this in my experience in planting at Union Park. The predominating colors in the back half of the garden included such as pink, salmon, orange, and the like. But after making a couple beds of Golden Bedder coleus it seemed to bring the entire background closer.

Some of you will perhaps disagree with me in my plea for a sharp contrast in adjoining colors. But if you will notice in particular a bed planted all red or all yellow, and the like, or two adjoining beds of the same color, and then look at one where the colors are contrasted, or at the beds as a whole, I have no doubt but that you will quite agree.

CIVIC IMPROVEMENT AND THE FLORIST.

G. A. HEYNE, DUBUQUE.

What can the florists of this state do for civic improvement?

First, by growing attractive greenhouse stock for spring planting and sales. This is generally supposed to cover all that the florist need do in the line for civic improvement. Some will add that they are prepared to plant this stock at the request of the interested buyers, and there stops that proceeding; others will give a seasons care in addition, and this brings us to the point, how much more can we do in regard to aiding in civic improvement? Are we making these plantings pleasing and attractive? Do they stimulate in the neighborhood a desire to do likewise? Would it not increase the florist's sales, would it not help the florist if he made the flower bed or window box of his customer so attractive that his next door neighbor could not resist the temptation of having some boxes filled like them? This would be aiding in civic improvement. The florists could also aid those in the desolate districts of the city. Imagine what a change it would make in a certain street of your city, if you gave to several of the residents a few plants, which you knew would endure some neglect, and give cheer for most the summer. By giving them to your customers to distribute, you could make up for any strained feeling regarding the recipient's poverty, and your customers would treat you with more respect and regard. Try giving some surplus stock to those willing to help in the distribution.

Now, let me suggest to you another way of civic improvement, Mr. Florist. There may be a vacant lot or piece of ground owned by the city or town, and this piece of ground has the distinction of being the dumping ground of the neighborhood; study your customers from this district, and take a few into your confidence with regard to the fixing up of this plot of ground. Be sure to consult the ladies interested, they

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will give you valuable aid, the men will also give you a lot of advice, from rosy results to dismal failure, give them all a fair chance. Remember, if at first you don't succeed, try, try again.

Now the material that the florist may use for these purposes need not be of the most expensive character. A quantity of vines on an obtrusive fence, say some cobeas and moonvines, would be more effective than any very costly or tender plants, and would be decidedly more effective. Use energetic plants that will give a thick foliaged effect, rather than those that give glory for two weeks and then have blighted and mildewed foliage for the rest of the season. Have some of these plants on your own grounds, and endeavor to have them thrive to their utmost, plant a corner as you would have your customers plant it, cover a fence, or make up a specially pretty porch box or vase. This will improve your place and help sell your stock. Plant in your grounds and in those of your neighbors as much of your surplus as you can spare, every place will be better for a flower instead of a weed.

EPIPHYLLUM, A CHRISTMAS PLANT.

F. J. OLSAN, AMES.

You are familiar with the plants, but to our loss we unjustly neglect them.

We are looking for novelties, pay high prices for them, but as a general rule we are greatly disappointed. I am sure all present have seen Epiphyllums covered with their own delicate blooms of brilliant Christmas colors. They interest everybody who sees them. They are not very fast growing, and are in consequence most useful for decorating either large or small plant houses. Being of a dense trailing or dependent habit, they show best when grafted on a small treelike stock. Although the species are few, the varieties are somewhat numerous, and are nearly all richly colored and attractive.

The culture is simple and the Nicholson Dictionary of Gardening gives the nearest correct manner of culture.

Propagation. This may be affected by short cuttings, taken from the branches, inserted singly in small pots, and placed in heat. The branches being unable to support themselves in an upright position when growing, this plan of cultivation is not much practiced except for use in baskets or in other positions where they are intended to hang down. For growing in pots, the general system adopted for Epiphyllums is to graft them on stocks, that may be first grown from cuttings to almost any desired height. The plants used as stocks are *Pereskia aculeata* and *P. Bleo*. These strike readily in sandy soil at any season, and should afterwards be potted and grown upright, until they reach the required height, which may vary from one to five feet. Grafting is easily performed, as it consists in merely pulling out a short branch just as growth commences in spring, afterwards opening the stocks either on the top or at any

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part of the side that is sufficiently hard, inserting the back part of the branch, and then passing one of the sharp spines from the Pereskia stock right through to hold all firmly. No other covering need be applied if the plants are in a moist, warm atmosphere. *P. Bleo* grows stronger, and is on that account suitable for tall specimens, while *P. aculeata* is more common and is generally used for dwarf or medium sized standards. By grafting at short distances up the stem, pyramid plants may be obtained by a system of training that have a fine effect when in flower. Large pyramids have also been grown for exhibition purposes.

Cultivation. Epiphyllums thrive in sandy soil with the addition of a little leaf soil and mortar rubbish. Good drainage is necessary and rather small pots; after grafting, the plants should be grown in heat until autumn, when they should be kept drier, and allowed to rest. Start them again in February, and grow in light position, allowing plenty of air in the latter part of the summer to thoroughly ripen the growths. The plants will have formed nice heads by this time, and may be brought into warmer quarters for flowering, a few at a time, so as to prolong the season. A temperature of 45 degrees will be high enough in the autumn, and only sufficient water to prevent shriveling should be supplied. The flowers will open in a temperature of 60 degrees, and may then be removed to a cooler position. After flowering, any necessary repotting should be performed, and the same routine again followed. When established in tolerably large pots, it is often best not to disturb the roots, but apply a top dressing of good soil instead. Epiphyllums increase in size for several years, if they can be kept in good health.

E. truncatum, bicolor—white with purple edge.

E. truncatum, coccineum—rich deep scarlet.

E. truncatum, magnificum—large white with tips rose colored.

E. truncatum, roseum—bright rose.

E. truncatum, Ruckeriaum—deep reddish purple with rich violet center.

E. truncatum, salmoneum—reddish salmon.

E. truncatum, spectabile—white with purple margin.

E. truncatum, violaceum—large white, with delicate purple margin.

E. truncatum, violaceum superb—pure white, with rich purple edge.

E. truncatum rusellueium rubiam—bright red rose.

E. truncatum rusellueium superbum—purple flower with white throat.

LATE.

E. truncatum rusellueium gartueri—Easter cactus—fiery scarlet.

Mr. Inenean-Poiries, gardener in Tours, and many others in Europe, have enriched the collection with some beautiful seedlings.

In the United States, only one firm grows Epiphyllums as a specialty, in three varieties, which they advertise in the trade paper, and I think this same firm can supply the trade with needed varieties of Pereskia.

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FRUIT LIST.

The following fruits are suggested as standard varieties for this State:

APPLES.

Duchess of Oldenburg, Wealthy for northern drift, Grimes' Golden, Winesap and Jonathan for southern loess.

CRABS.

Hyslop, Florence, Martha, Virginia.

PLUMS.

DeSoto, Wyant, Miner.

CHERRIES.

Early Richmond, Montmorency.

GRAPES.

Moore's Early, Worden, Concord.

RASPBERRIES.

Older, Kansas.

BLACKBERRIES.

Snyder.

CURRANTS.

Victoria, Red Dutch, White Grape.

GOOSEBERRIES.

Downing.

STRAWBERRIES.

Dunlap, Warfield.

While none of the varieties mentioned are perfect, they have proven the most satisfactory out of all varieties tested and can be safely used as a standard for comparing other varieties.

To extend the standard list we add the following supplemental list:

APPLES.

For Northern Drift: Patten's Greening, Longfield. Charlamoff, Salome, Malinda, Northwestern Greening. Sweet apples—Tolman.

For Southern Loess: Benoni, Maiden's Blush, Fameuse, Stayman, Genet, Roman Stem, Gano. Sweet apples—Sweet June, Ramsdell's Sweet, Paradise Winter Sweet. For dessert use—Early Joe, Fall Wine, Chenango, Delicious, Dyer, Rambo.

PEARS.

Keiffer, Seckel, Flemish Beauty, Bartlett.

PEACHES.

For Southern Loess: Champion, Crosby, Elberta, Triumph.

GRAPES.

For Southern Loess: Diamond, Niagara, Agawam, Brighton.

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RASPBERRIES.

For Southern Loess: Cuthbert, Turner, Cumberland, Columbian.

DEWBERRIES.

Lucretia.

The State society does not recommend a list of fruits for planting in any district. It recognizes the fact that each grower can select varieties better adapted to his locality than anyone else. The list given is to assist those who have not given much study to varieties. Where no locality is mentioned the varieties named are for general planting and all soils. The northern part of the State is mostly covered with drift and the southern part with loess. The soil, rainfall and elevation changes the temperature so that the thermal zones do not correspond with degrees of latitude. As an example: Budded peaches seldom prove profitable when planted north of the line showing a mean annual temperature of 49 degrees, though they may be grown much farther north.

FUNGICIDES.

Copper and sulphur are the substances generally used to destroy fungus. The copper is either in combination with sulphur or carbon. Copper sulphate can be used on dormant wood at the strength of one pound to 25 gallons of water, but on foliage it should be diluted with 200 to 250 gallons of water. Lime is an adultrant to separate the particles of copper sulphate so they will not act so rapidly. The lime reduces the caustic action of the copper sulphate.

Full strength bordeaux is made by dissolving six pounds of copper sulphate in 25 gallons of water, and slaking four pounds of lime in 25 gallons of water in another vessel, then pouring the two solutions together into a third vessel; only the more resistant foliage can stand this strength without injury. A more common formula is five pounds of copper sulphate five pounds of fresh lime and 50 gallons of water. This strength of bordeaux is used in spraying potatoes for blight, and grapes for black and brown rot. The 4-4-50 formula is used as the first application for apple scab before the blossoms open. The 3-3-50 or 3-4-50 for later spraying. These formulas are too strong for peach or plum foliage unless more lime is added. Twice as much lime is used in spraying peach foliage as for apple or more resistant foliage.

Ammonical Carbonate. Dissolve five ounces of copper carbonate in three pints of ammonia and dilute with 50 gallons of water. Use this fungicide when the fruit is nearly ready to pick, or when the color of the bordeaux mixture would be objectionable.

Sulphur is used either free, or in combination with lime or potassium. One pound of potassium sulphide in 50 gallons of water is a good remedy for mildew.

Self-boiled lime-sulphur wash is made with equal parts of lime and sulphur. Prof. W. M. Scott's formula for treating less resistant fungi is made by slaking 10 pounds of sulphur and enough water to make a thin mush and then diluting with enough water to make 50 gallons of mixture.

The boiled lime-sulphur wash is made by boiling in water for one hour

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one part of lime to two parts of sulphur; varying from that to equal parts of lime and sulphur. The amount of sediment remaining after boiling depends on the purity of the lime. Experiments seem to show that boiled lime sulphur can be used on dormant wood at the rate of one pound of sulphur to four or five gallons of water; but on foliage it should not be stronger than one pound of sulphur to 12 or 15 gallons of water, and on the less resistant foliage not less than 20 gallons of water should be used with each pound of sulphur.

The different brands of commercial lime-sulphur solution vary in strength. The amount of dilution necessary is determined by using a hydrometer.

The lime-sulphur wash does not russet the fruit that sometimes occur when bordeaux mixture is used.

The best time to spray for apple scab is just before the blossoms open. The next application should be given when the leaves unfold. If the foliage could be kept covered with a fungicide it would be protected from the fungus.

For Potato Scab: One pint formalin to 30 gallons of water. Soak the potatoes in it for two hours.

For Grain Smut. One pint of formalin to 50 gallons of water. Sprinkle the grain with it until the seeds are all wet; dry before sowing.

INSECTICIDES.

For Biting Insects: Lead acetate, 24 ounces; arsenate of soda, ten ounces. Dissolve each separately in a pail half full of water, then dilute the arsenate of soda with 48 gallons of water, stir, then add the lead acetate. It makes a better spray when diluted before mixing the lead acetate with the arsenated of soda.

Lead arsenate can be bought ready for use when diluted with water.

Lead arsenate is used in combination with bordeaux mixture and with lime-sulphur wash at the rate of two pounds to 50 gallons. The lead arsenate is more or less decomposed in the presence of sulphur; forming lead sulphate and lime arsenate, but its insecticidal value is not destroyed and the fungicide seems to be more adhesive and less caustic than when arsenate of lime is used.

There is less danger of burning the foliage when lead arsenate is used than with paris green; the latter is not soluable in water and settles rapidly in water unless agitated.

Paris green, one pound; lime, three pounds, to 150 gallons of water is strong enough to kill most insects that eat foliage.

The best time to spray to destroy coddling moth is just after the bloom has fallen, but before the calyx lobes close. For the second brood spray late in July or first of August.

For sucking insects: Kerosene, two gallons; soap half pound; water, one gallon. Dissolve the soap in hot water, mix all together and churn violently for a few minutes, then dilute with 15 gallons of water.

Tobacco tea: Soak one pound of tobacco stems in three gallons of water.

With the proper use of these formulas the fruit grower can control insects and fungi so they will do little damage to his crops.

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CATALOGUE OF BOOKS IN THE LIBRARY.

(Reports of Societies and Bulletins of Experiment Stations are omitted.)

Name of Author	Title of Publication.
Allen, Joel Asaph	History of North American Pinipeds.
Allen, C. L.	Bulbs and Bulbous Rooted Plants.
	Cabbages, Cauliflower, and Allied Vegetables.
American Ornithologists Union	Check List of North American Birds.
Anders, J. M.	House Plants as Sanitary Agents.
Arnott, S.	The Book of Bulbs.
Apgar, Austin C.	Trees of the Northern United States.
Bailey, L. H.	The Forcing Book.
+	The Horticulturist's Rule Book.
—	Plant Breeding.
—	The Nursery Book.
+	The Principles of Fruit Growing.
—	The Evolution of our Native Plants.
	The Pruning Book.
	The Survival of the Unlike.
	The Nature Study Idea.
+	Cyclopedia of Horticulture, 4 Vol.
	Cyclopedia of American Agriculture, 4 Vol.
	Field Notes of Apple Culture.
Bailey, L. H., and C. E. Hunn	The Practical Garden Book.
Baines, Thomas	Greenhouse and Stove Plants.
Baker, J. G.	A Handbook of the Irideae.
	A Handbook of the Amaryllideae.
Barnes, Charles Reid	Plant Life.
Balfour, J. H.	Class Book of Botany, 2 Vol.
Barnard, Charles	A Simple Flower Garden for Country Homes.
Barry, Patrick	Barry's Fruit Garden.
Barron, Leonard	Lawns and How to Make Them.
Beach, S. A.	Apples of New York, 2 Vol.
Beal, W. J.	Grasses of North America, 2 Vol.
Beattie, W. R.	Celery Culture.
Bently, Robert	Physiological Botany.
Behrens, Dr. Julius Wilhelm. Translated by Rev. A. B. Hervey and R. H. Ward	A Guide for the Microscopical Investigation of Vegetable Substances.
Bennett, Alfred W. and George Murray	A Handbook of Cryptogamic Botany.
Bennett, Ida D.	The Flower Garden.
	The Vegetable Garden.
Berkley, M. J.	Outlines of British Fungology.
	Introduction to Cryptogramic Botany.
Bessey, Charles E.	Botany, Advanced Course.
	The Essentials of Botany.
Bisset, Peter	A Book of Water Gardening.
Blanchan, Neltje	Nature's Garden.
	The American Flower Garden.
Blasius, William	Storms; their Nature, Classification and Laws.
Blodgett, Lourin	Climatology of the United States.

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CATALOGUE OF BOOKS—CONTINUED

Name of Author.	Title of Publication
Boyce, S. S.	Hemp.
Brehm, Dr. A. E.	Bird Life.
Bridgemann, Thomas	Fruit Gardening.
Brill, Francis	Farm Gardening and Seed Growing.
Britton, Thomas Allen ...	A Treatise on Dry Rot in Timber.
Britton, Nathaniel Lord, and Addison Brown ...	An Illustrated Flora of the United States and Canada, 3 Vol.
Britton, Nathaniel Lord..	Manual of the Flora of the Northern States and Canada.
Brown, James Crombie ..	French Forest Ordinances of 1669.
Brown, John P.	Practical Arboriculture.
Brown, D. J.	Trees of America.
Bruncken, Ernest	North American Forests and Forestry.
Bower, F. O.	Practical Botany.
Budd, J. L. and N. E. Hansen	American Horticultural Manual, 2 Vol.
Burbridge, F. W.	Cultivated Plants; Their Propagation and Improvement.
Bush & Son, and Meissner.	Illustrated Descriptive Catalogue of American Grape Vines; a Grape Growers Manual.
Card, Fred W.	Bush Fruits.
Carpenter, Wm. B.	The Microscope and Its Revelations.
	Vegetable Physiology and Systematic Botany.
Chapman, A. W.	Flora of the Southern United States.
Chester, Frederick D. ...	A Manual of Determinative Bacteriology.
Chittenden, F. H.	Insects Injurious to Vegetables.
Clute, Willard N.	Our Ferns in Their Haunts.
	The Fern Allies.
Coburn, F. D.	Alfalfa.
Cohen, Julius B.	Practical Organic Chemistry.
Cole, S. W.	The American Fruit Book.
Comstock, John Henry ...	Insect Life.
Conard. Henry S. and Henri Hus	Water Lilies and How to Grow Them.
Cooke, M. C.	Introduction to the Study of Fungi.
Cooke, M. C., edited by Rev. M. J. Berkley	Fungi.
Coulter, John M.	Manual of the Botany of the Rocky Mountain Region.
	Text Book of Western Botany with Gray's Lessons in Botany.
Coxe, William	A View of the Cultivation of Fruit Trees and the Management of Orchards and Cider.
Craigin, Belle S.	Our Insect Friends and Foes.
Creevey, Caroline A.	Flowers of Field, Hill and Swamp.
Croll, James	Discussions on Climate & Cosmology.
Crookshank, Edgar M...	Manual of Bacteriology.
Dana, James D.	Manual of Geology.
Dana, Mrs. Wm. Star	According to the Season.
Darwin, Charles	The Power of Movement in Plants.
	Insectivorous Plants.
	The Different Forms of Flowers and Plants of the Same Species.
	The Variation of Animals and Plants under

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CATALOGUE OF BOOKS—CONTINUED

Name of Author	Title of Publication
	Domestication, 2 Vol.
	The Origin of Species.
	Formation of Vegetable Molds.
	On the Fertilization of Orchids by Insects.
Davey. John	The Tree Doctor.
Davis, J. R. Ainsworth	A Text-Book of Biology.
Davis, Lucius A	Ornamental Shrubs.
Dawson, Sir William J	The Geological History of Plants.
DeCandolle, Alphonse	The Origin of Cultivated Plants.
DeVries, Hugo	Species and Varieties, Their Origin by Mutation.
	Plant Breeding.
Dickerson, Mary C	The Frog Book.
Doubleday, Page & Co	Roses and How to Grow Them.
Downing, Andrew Jackson.	A Treatise on the Theory and Practice of Landscape Gardening.
Drury, W. D.	A Book of Gardening.
Dugmore, A. Radclyffe	Nature and the Camera
Eaton, Amos	Manual of Botany for North America.
Eger, Gustav, and Otto Brandes	Egers Technical Dictionary, 2 Vol.
Egleston, Nathaniel H	The Handbook of Tree Planting.
Ellis, J. B. and B. M. Everhart	North American Pyrenomycetes.
Elliott, F. R.	A Handbook of Practical Landscape Gardening.
	Handbook for Fruit Growers.
	Elliott's Fruit Book.
	Popular Deciduous and Evergreen Trees and Shrubs.
Elliott, J. Wilkinson	A Plea for Hardy Plants.
Ellwanger, H. B.	The Rose.
Ellwanger, George H	The Garden Story.
Emerson, George B. and Chas. L. Flint	Manual of Agriculture.
Emerson, Geo. B.	Trees and Shrubs of Massachusetts, 2 Vol.
Falconer, William	Mushrooms; How to Grow Them.
Flagg, Wilson	A Year Among the Trees.
Fletcher, S. W.	How to Make a Fruit Garden.
Forsythe, William	A Treatise on the Culture and Management of Fruit Trees.
Foster-Melliar, Rev. A	The Book of the Rose.
Foster, J. W.	The Mississippi Valley; Its Physical Growth.
Fortune, Robert	Two Visits to the Tea Countries of China, 2 Vol.
Fraser, Samuel	The Potato.
Fritz, James	Sweet Potato Culture.
Frost, William Dodge	A Laboratory Guide in Elementary Bacteriology.
Fuller, Samuel S.	The Small Fruit Culturist.
	The Fruit Tree Culturist.
	The Grape Culturist.
	The Illustrated Strawberry Culturist.

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CATALOGUE OF BOOKS—CONTINUED

Name of Author	Title of Publication.
Fullerton, Edith Loring...	How to Make a Vegetable Garden.
Fulton, James Alexander..	Peach Culture.
Galloway, B. T.	Commercial Violet Culture.
Gifford, John	Practical Forestry.
Goebel, Dr. K.	Outlines of Classification and Special Morphology of Plants.
Goff, E. S.	Principles of Plant Culture.
Going, Maud	With the Wild Flowers.
	With the Trees.
Goodale, George L. and Isaac Sprague	The Wild Flowers of America.
	Physiological Botany.
Gray, Asa	How Plants Grow.
	The Darwiniana.
	Structural Botany.
Greene, Wesley	Plants of Iowa.
Green, Samuel B.	Forestry in Minnesota.
	Amateur Fruit Growing.
	Vegetable Gardening.
Greiner, T.	How to Make the Garden Pay.
	New Onion Culture.
Griffiths, A. B.....	The Diseases of Farm Crops and Their Remedies.
Gunning, Wm. D.	Life History of Our Planet.
Guyot, Arnold, translated by C. C. Felton	The Earth and Man.
Haeckel, Ernest, translated by E. Ray Lancaster....	The History of Creation.
Hall, James	A Report of the Geological Survey of the State of Iowa, 2 Vol.
Hall, Fredrick G.....	Flower Fables and Fancies.
Harris, Thaddeus William	A Treatise on Some of the Insects Injurious to Vegetation.
Harris, Joseph	Talks on Manures.
Hedrick, U. P.	The Grapes of New York.
Henderson, Charles	Picturesque Gardens.
Henderson, Peter	Handbook of Plants.
	Gardening for Pleasure.
Henslow, Rev. George	Origin of Floral Structures Through Insects and Their Agencies.
Henfrey, Arthur	The Vegetation of Europe, Its Conditions and Causes.
Hexamer, F. M.	Asparagus.
Hibberd, Shirley, revised by Geo. Gordon	The Amateur's Rose Book.
	The Amateur Kitchen Garden, Frame-Ground and Forcing Pit.
Hillhouse, Lizzie Page ...	House Plants, and How to Succeed with Them.
Hilgard, E. W.	Soils.
Hogg, Jazeb	The Microscope.
Hogg, Robert	The Fruit Manual.
Hole, S. Reynolds	A Book of Roses.
Holland, W. J.	The Butterfly Book.

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CATALOGUE OF BOOKS—CONTINUED

Name of Author	Title of Publication
	The Moth Book.
Holtz, Frederick L.....	Nature Study.
Hough, Romeyn Beck	Handbook of the Trees of the Northern States and Canada.
Hough, Franklin B.	A Report Upon Forestry.
Hovey, C. M.	The Fruits of America, 2 Vol.
Howard, Leland O.	The Insect Book.
Humboldt, Alexander Von.	The Iowa State Atlas, 1904.
Huebinger, M.	Cosmos, 5 Vol. in 2.
Translated by E. C. Otte..	Views of Nature, or the Contemplation of the Sublime Phenomena of Creation.
Hume, H. Harold	Citrus Fruits and Their Culture.
Husmann, George	Grape Culture and Wine Making in California.
	American Grape Growing and Wine Making.
Huxley, Thos. H.	The Origin of Species.
	Evidence as to Man's Place in Nature.
	American Addresses, with a Lecture on the Study of Biology.
	Physiography.
Jackson, B. O.	A Glossary of Botanic Terms.
Jackson, Benjamin Daydon	Guide to the Literature of Botany.
Jarchow, Nicholas H.....	Forest Planting.
Johns, Rev. C. A.	The Forest Trees of Britain.
Johnson, Willis G.	Fumigation Methods.
Johnson, Samuel W.	How Crops Feed.
Johnson, James Forsythe..	Residential Sites and Environments.
Johnson, George W.	Johnson's Gardeners' Dictionary; revised by C. R. Wright and D. DeWar.
Jonsson-Rose, N.	Lawns and Gardens.
	Window and Parlor Gardening.
Jekyll, Gertrude	Home and Garden.
Kains, M. G.	Ginseng.
Keeler, Harriet L.	Our Native Trees.
Kemp, Edward	How to Lay Out a Garden.
Kerner & Oliver	Natural History of Plants, 2 Vol.
Kenrick, William	The New American Orchardist.
King, F. H.	The Soil.
Killibrew, J. B. and Herbert Myrick	Tobacco Leaf.
Kirby, A. M.	Daffodils, Narcissus, and How to Grow Them.
Klippart, John H.	The Principles and Practice of Land Drainage.
Landreth, Burnett	Market Gardening and Farm Notes.
Lea & Blanchard	The Complete Florist; the Manual of Gardening.
Lesquereux & James	Mosses of North America.
Lindley, John, and Thomas Moore	The Treasury of Botany, 2 Vol.
Lock, C. G. Warnford....	Tobacco Growing, Curing and Manufacturing.
Lodeman, E. G.	The Spraying of Plants.
Long, Elias A.	Ornamental Gardening for Americans.
Long, Harold C.	Common Weeds of the Farm and Garden.
Loudon, J. C.	Arboretum et Fruiticetum Brittannicum, 8 Vol.

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CATALOGUE OF BOOKS—CONTINUED

Name of Author	Title of Publication
	Encyclopedia of Plants.
	Encyclopedia of Gardening.
	The Landscape Gardening and Landscape Architecture of the late Humphrey Repton, Esq.
Lounsberry, Alice, and Mrs. Ellis Rowan	A Guide to the Trees.
Lounsberry, Alice	A Guide to the Wild Flowers.
Lowe, E. J.	A Natural History of British Grasses.
Lubbock, Sir John	Contribution to Our Knowledge of Seedlings.
Macbride, Thomas H. ...	North American Slime Moulds.
	Lessons in Elementary Botany.
MacMillan, Conway	Metaspermae of the Minnesota Valley.
	Minnesota Plant Life.
Many Authors	How to Make a Flower Garden.
Marshall, Nina L.	The Mushroom Book.
Massee, George	British Fungus Flora, 4 Vol.
	A Text Book of Plant Diseases.
Masters, Maxwell T.	Plant Life on the Farm.
Matthews, R. Schuyler....	Field Book of American Wild Flowers.
	Familiar Trees and Their Leaves.
May, W. J.	Vegetable Culture for Amateurs.
Maynard, Samuel T.	Successful Fruit Culture.
	Landscape Gardening as Applied to Home Decoration.
	The Small Country Place.
Mayron, Maud	How the Garden Grew.
McIlvaine, Charles	One Thousand American Fungi.
Meehan, Thomas	The American Handbook of Ornamental Trees.
Miller, Mary Rogers	Native Flowers and Ferns, 4 Vols.
Miller, Mary A.	The Brook Book.
	Catalogue of State Library of Iowa.
Miller, Ellen, and Margaret Christine Whiting..	Wild Flowers of the Northeastern States.
Miller, William	A Dictionary of English Names of Plants.
Moloney, Alfred	A Sketch of Forestry of West Africa.
Morse, J. E.	The New Rhubarb Culture.
Muir and Ritchie	Manual of Bacteriology.
Munson, V. T.	Foundations of Grape Culture.
Myrick, Herbert	The American Sugar Industry.
	The Book of Corn.
Newhall, Charles S.	The Shrubs of Northeastern America.
	The Trees of Northeastern America.
	The Vines of Northeastern America.
Nicholson, George	An Illustrated Dictionary of Gardening, 4 Vol.
Oakes-Huntington, Annie.	Studies of Trees in Winter.
Oliver, George W.	Plant Culture.
Packard, A. S.	Guide to the Study of Insects.
Pammel, Dr. L. H.....	Weeds of the Farm and Garden.
	A Manual of Poisonous Plants.
Pardee, R. G.	A Complete Manual for the Cultivation of the Strawberry.
Parkhurst, H. S.	Trees, Shrubs and Vines.

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CATALOGUE OF BOOKS—CONTINUED

Name of Author	Title of Publication
Parsons, Samuel B.	Parsons on the Rose.
Pasteur, L.	Studies on Fermentation.
Paul, William	The Rose Garden.
Paxton, Joseph, revised by Samuel Harriman	Paxton's Botanical Dictionary.
Percival, John	Agricultural Botany.
Pickering, Charles, revised by John Charles Hall	Pickering's Races of Man.
Plumb, Charles S.....	Indian Corn Culture.
Plowright, Charles B.....	A Monograph of the British Uredineae and Ustilagineae.
Pontey, William	The Forest Pruner.
Poole, Mrs. Hester M.	Fruits and How to Use Them.
Sohn, Charles E.....	The Orchard and Fruit Garden.
Prince, William	A Short Treatise on Horticulture.
	Pomological Manual, 2 Vol.
	A Treatise on the Vine.
Quinn, P. T.	Pear Culture for Profit.
Rexford, Eben E.	Home Floriculture.
	Four Seasons in the Garden.
Roe, E. P.	The Home Acre.
Roberts, Isaac Phillips ..	The Fertility of the Land.
	The Farmstead.
Robinson, Charles Mulford	Modern Civic Art, or the City Made Beautiful.
	The Improvement of Towns and Cities.
Robinson, William	The Wild Garden.
	The English Flower Garden.
	The Vegetable Garden.
Rogers, Julia Helen	The Shell Book.
	The Tree Book.
Romanes, George J.	The Scientific Evidences of Organic Evolution.
Rutherford-Ely, Helena ..	A Woman's Hardy Garden.
Samuel, Mark	The Amateur Aquarist.
Sanders. T. W.	The Amateur Greenhouse.
	An Encyclopedia of Gardening.
Sanderson, Dwight E.	Insects Injurious to Staple Crops.
Sargent, Charles Sprague.	Manual of Trees of North America.
	The Sylva of North America, 14 Vol.
	Trees and Shrubs, Vol. 1.
Saunders, Wm.	Insects Injurious to Fruit.
Say, Thomas	American Entomology, 4 Vols.
Schmidt, Oscar	Doctrine of Descent and Darwinism.
Schneider, George	The Book of Choice Ferns, 3 Vol.
Schneider, Albert	A Guide to the Study of Lichens.
	A Text Book on Lichenology.
Scott, Frank J.	The Art of Beautifying Suburban Home Grounds.
Scott, William	The Florist's Manual.
Sevey, Glen C.	Bean Culture.
Shaw, Thomas	Clovers, and How to Grow Them.
Smith, Robert Angus	Air and Rain.
Smith, Sir James Edward.	The English Flora. 4 Vol.

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CATALOGUE OF BOOKS—CONTINUED

Name of Author	Title of Publication
Smith, John	Dictionary of Economic Plants.
Smith, Worthington G.	Diseases of Field and Garden Crops.
Smith, John B.	Economic Entomology.
Soh, Charles E.	Dictionary of the Active Principles of Plants.
Sowerby, James	English Botany, 14 Vol.
Spillman, William Jasper.	Farm Grasses of the United States.
Sternberg, George M.	A Text Book on Bacteriology.
Strasburger, Dr., E. Schenck, Noll and Schimper	A Text Book on Botany.
Strasburger, Dr. E., revised by W. Hillhouse	The Handbook of Practical Botany.
Taft, L. R.	Greenhouse Management.
Taylor, Thomas	Student's Handbook of Mushrooms of America, Edible and Poisonous.
Terry, T. B. and Root, A. I.	The A. B. C. of Strawberry Culture.
Thomas, John J.	The American Fruit Culturist.
Thome, Otto W., and Alfred W. Bennett	Text Book of Structural and Physiological Botany.
Thompson, Robert, and Wm. Watson	The Gardener's Assistant.
Todd, Edward Severn	The Apple Culturist.
Tracy, Will C.	Tomato Culture.
Treat, Mary	Injurious Insects of Farm and Garden.
Trouessart, E. L.	Microbes, Ferments and Moulds.
Tyndall, John	Fragments of Science.
	Heat, Mode of Motion.
	The Forms of Water.
Underwood. Lucien Marcus	Our Native Ferns and Their Allies.
	Moulds, Mildews and Mushrooms.
United States Entomological Commission	Second Report Rocky Mountain Locust and Western Cricket.
Vines, Sidney H.	An Elementary Text Book of Botany.
	Lectures on the Physiology of Plants.
Von Mueller, Baron Ferd.	Select Extra Tropical Plants.
Von Sachs, Julius	Lectures on the Physiology of Plants.
Von Tubeuf, Dr. Karl Freiherr & Wm. G. Smith.	Diseases of Plants.
Voorhees, Edward B.	Fertilizers.
Wallace, Alfred Russell.	Geographical Distribution of Animals.
	Island Life.
Wahnschaffe, Dr. Felix, revised by Wm. T. Brandt.	A Guide to the Scientific Examination of Soils.
Ward. H. Marshall	Timber and Some of Its Diseases.
	The Oak.
Watson, Alexander	The American Home Garden.
Ward, Charles Willis	The American Carnation and How to Grow It.
Warder, Doct. John A.	American Pomology.
Waugh, F. A.	Dwarf Fruit Trees.

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CATALOGUE OF BOOKS—CONTINTED

Name of Author	Title of Publication
	Systematic Pomology.
	Plums and Plum Culture.
	Fruit Harvesting, Storing, Marketing.
Weathers, John	A Practical Guide to Garden Plants.
Weed, Clarence M.	Spraying Crops.
	Insects and Insecticides.
	Fungi and Fungicides.
	Our Trees; How to Grow Them.
	Wild Flower Families.
Weidenmann, J.	Beautifying Home Grounds; A Handbook of Landscape Gardening.
Wilcox, Lucius M.	Irrigation Farming.
Willis, Oliver R.	A Practical Flora for Schools and Colleges.
† Winchell, Alexander	Walks and Talks in the Geological Field.
Wolle, Rev. Francis	Fresh Water Algae of the United States.
	Desmids of the United States.
	Diatomaceae.
Wood, John	Hardy Perrenials and Old Fashioned Garden Flowers.
Wood, Alphonso	Class Book of Botany with Flora of United States and Canada.
Woolson, G. A.	Ferns and How to Grow Them.

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In Memoriam

This page is dedicated to the memory of Life Members that have died since the last meeting of the Society

L. G. CLUTE, of Manchester, was a member of the society for nine years. He was a successful exhibitor at the state fair and at national expositions.

DAVID EVANS, of Des Moines, was a member of the society for eleven years. He was interested in developing a fruit farm at Des Moines, and at Whittier, California.

R. D. McGEEHON, of Atlantic, was an Honorary Life Member of the society for eleven years. He was successful in strawberry culture, and has written many valuable papers for the reports of the society.

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FRIDAY, DECEMBER 10.

BOARD MEETING.

The Board of Directors was called to order by President William Langham at 9 o'clock a. m.

Members present: C. G. Blodgett, John Forster, A. B. Dennis, C. O. Garrett, W. B. Chapman, W. C. Haviland, L. A. Clemmons, C. H. True, F. C. Gardner, and Eugene Secor.

On motion all bills incurred during the year were audited and approved.

C. L. Watrous submitted the account of the Experiment Committee which was upon motion approved.

Upon motion the old Board adjourned and the new board duly convened.

Members present: C. G. Blodgett, John Forster, Geo. H. Van Houten, A. B. Dennis, Millard Harrington, C. O. Garrett, W. B. Chapman, C. H. True, W. C. Haviland, L. A. Clemmons, C. F. Gardner and Eugene Secor.

The matter of buttons for the members was taken up for consideration, and upon motion the Secretary was instructed to buy a good button, to be paid for by the life members at or about cost, if a hundred or more members expressed a desire to purchase them, and that a cheaper button be provided for the annual members.

Upon motion the Secretary was instructed to pay for the buttons in the first instance out of the contingent fund and sell them to the members.

Upon motion, M. J. Graham was elected to succeed himself as a member of the Supervising Committee.

The matter of renting the acre orchard at Waukee was upon motion referred to the Executive Committee to investigate, with power to act, and upon a further motion M. J. Graham was added to the membership of the Executive Committee.

The rules were read for revision. Rule 16 was amended by inserting the sum of $250 instead of $500 to be appropriated for carrying on the work at the experiment stations.

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Rule 20 was amended by adding the name of M. J. Wragg to the legislative committee, Mr. Secor requesting to be relieved from further duties.

Upon motion, the rules were adopted as amended and read.

The premium list was read. After some discussion the same was approved as read.

Upon motion, the matter of canned fruit under discussion was referred to the Executive Committee.

The appropriation list was read.

Upon motion, the salary of the Secretary was fixed at $1,500, and the salary of the Treasurer at $100.

Upon motion, $200 was set aside to be used by the Secretary for the purpose of publishing and distributing bulletins.

$100 was appropriated for the library, and $300 for a contingent fund.

Upon motion, $728 was ordered paid Secretary Greene upon indebtedness owing from the Society.

Upon motion the Board adjourned.

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PROCEEDINGS

OF THE

NORTHEASERN IOWA HORTICULTURAL SOCIETY

HELD AT

Cedar Falls, Iowa, November 15, 16 and 17, 1910

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OFFICERS FOR 1911.

G. D. BLACK, President.....Independence
E. BLAKEMAN, Vice President.....Decorah
CHAS. F. GARDNER, Secretary.....Osage
REV. C. H. TRUE, Treasurer.....Edgewood

BOARD OF DIRECTORS.

First District—W. A. Burnap.....Clear Lake
Second District—Earnest C. Patten.....Charles City
Third District—John Harter.....Locust
Fourth District—W. H. Guilford.....Dubuque
Fifth District—E. M. Reeves.....Waverly
Sixth District—B. F. Ferris.....Hampton

COUNTIES IN EACH DISTRICT.

First District—Winnebago, Worth, Hancock and Cerro Gordo counties.
Second District—Mitchell, Howard, Floyd and Chickkasaw counties.
Third District—Winneshiek, Allamakee, Fayette and Clayton counties.
Fourth District—Dubuque, Delaware and Buchanan counties.
Fifth District—Butler, Bremer, Grundy and Black Hawk counties.
Sixth District—Wright, Franklin, Hamilton and Hardin counties.

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LIST OF MEMBERS.

LIFE MEMBERS.

Black, G. D.....Independence
Brown, Eugene .....Mason City
Ferris, S. W.....Hampton
Freeman, J. P.....Hazleton
Mott. D. W.....Hampton
Parker, A. T.....Mason City
Reeves, Elmer M.....Waverly
Schmidt, A. C.....Wadena
Sherman, E. M.....Charles City
Snider, S. J.....Osage

HONORARY LIFE MEMBERS.

Babcock, Mrs. Nancy.....Nora Springs
Beach, Prof. S. A.....Ames
Burnap, W. A.....Clear Lake
Ferris, B. F.....Hampton
Ferris. J. C.....Collins, Mont
Gaylord, Edson.....Nora Springs
Gardner, Chas. F.....Osage
Greene, Prof. Wesley.....Davenport
Guilford, W. H.....Dubuque
Hawkins, J. C.....Austin, Minn.
Mitchell, J. B.....Cresco
Moore, O. W.....Spring Valley, Minn.
Patten, C. G.....Charles City
Richardson, S. D.....Winnebago, Minn.
Schutz, R. A.....Le Roy, Minn.
Secor, Hon. Eugene.....Forest City
Wedge, Hon. Clarence.....Albert Lea, Minn
Wedge, Mrs. C.....Albert Lea, Minn.

ANNUAL HONORARY MEMBERS.

Cooper, Samuel.....Delevan, N. Y.
Miller, Frank B.....Cedar Falls
Jarnagin, J. W.....Cedar Falls
Mitchell, D. M.....Owatonna, Minn.

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ANNUAL MEMBERS.

Alexander, Willard ..... Cedar Falls
Brown, H. R. ..... Cedar Falls
Burr Brothers ..... Cedar Falls
Boice, R. H. ..... Republic
Blakeman, E ..... Decorah
Chase, H. L. ..... Cedar Falls
Clausen, Peter ..... Albert Lea
Fisk, J. M. ..... Cedar Falls
Fevre, A. Le ..... Earlville
Gerken, E. F. & Co. ..... Cedar Falls
Harter, John ..... Locust
Johnson, Henry ..... Cedar Falls
Jepson, J. P. ..... Cedar Falls
Miller, F. B. ..... Cedar Falls
Mullarky, W. G. ..... Cedar Falls
Pfeiffer, J. B. ..... Cedar Falls
Patten, Earnest C. ..... Charles City
Stevens, J. Scott ..... Cedar Falls
Sattley Brothers ..... Cedar Falls
Security Savings Bank ..... Cedar Falls
Wise, C. A. ..... Cedar Falls
Westlaub Shoe Co. ..... Cedar Falls
Wild, C. J. ..... Cedar Falls
Woodruff, Geo. S. ..... Independence
Wildhagen, F. C. ..... Waterloo
Weatherly, M. H. ..... Charles City

The society's headquarters were at the Arlington, where we had good accommodations and were very pleasantly entertained. The fine exhibit of apples by Rev. C. H. True, added much to the interest of the meeting. They were all grown on trees planted by him in his orchard, near Edgewood. Considering the season it was a very remarkable exhibit.

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LIST OF PREMIUMS.

The 27th annual session of this society will be held in City Hall, Waterloo, Tuesday, Wednesday and Thursday, November 14-15-16, 1911.

Best collection of apples grown by exhibitor	$6.00
Second best exhibit of apples grown by exhibitor	4.00
Best collection of seedlings grown by exhibitor	2.00
Second best collection of seedlings grown by exhibitor	1.00
Best seedlings not exhibited prior to 1909	2.00
Second best seedlings not exhibited prior to 1909	1.00
Best collection of apples recommended for the northern district	2.00
Second best collection of apples recommended for the northern district	1.00
Best plate each variety, same as above	1.00
Best ten plates other varieties worthy of cultivation, each	.50
Best display canned fruits and jellies	3.00
Best display cut flowers	5.00
Best specimen plant in bloom	1.00
Best new plum with origin and history	2.00
Best ten ears of corn grown by exhibitor in district	3.00
Best peck of potatoes grown by exhibitor	1.00

All apples competing for premiums must be grown in northern district and all new seedlings must be accompanied by a statement of origin, history and nature of soil and environments where grown. Five apples shall constitute a plate and each variety must be plainly and carefully named.

Flower and plant premiums are open to every one. Fruit premiums only to those who become members.

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PROCEEDINGS

OF THE

NORTHEASTERN IOWA HORTICULTURLAL SOCIETY

HELD AT

Cedar Falls, Iowa, November 15, 16 and 17, 1910

The society met in the city hall, Cedar Falls, and was called to order by the President, Rev. C. H. True, of Edgewood. The invocation was given by the Rev. J. E. Snowden. Then the President called for the reading of the reports of the Directors which was done in the following order.

Col. W. A. Burnap, the director of the First District being sick and in his brother's hospital at Pelican Rapids, Minn., was excused from duty and the secretary of the Society was ordered on motion, to send him the compliments of the society and our best wishes for his speedy recovery.

The report of the Second District was made by C. G. Patten of Charles City, Iowa.

The Third District, John Harter, Director.

The Fourth District, W. H. Guilford, Director, was absent and I have been unable to find out the reason as I have received no answers to my letters to him; he has been always such a faithful member of this society, ever ready to respond in an able manner, whenever called upon, we know his absence was no fault of his.

The Fifth District, Elmer Reeves, Director.

The Sixth District, B. F. Ferris, Director.

It has been thought best to consolidate these reports as they are so near alike. The total failure of tree fruits was reported generally throughout the northeast quarter of the state, with the exception of a few isolated cases as that of Rev. C. H. True, at Edgewood, had a little above a quarter of a crop, of well formed apples. Small fruits were conspicuous by their absence, except here and there from

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a quarter to half a crop of strawberries. Several reported about half a crop of grapes. All agreed that it was the worst season they ever experienced in trying to grow fruits in Iowa. Farm crops of all kinds were generally good.

Letters from W. A. Burnap, B. F. Ferris, J. C. Hawkins, O. W. Moore, were read by the secretary. The letters stated that the writers were unable on account of sickness and infirmity to attend the present meeting and wished us an abundant success in our horticultural discussions. On motion the secretary was ordered to reply to the brothers and tell them how much we miss them and hope they will soon recover.

The delegate from the Minnesota Horticultural Society, Mr. D. M. Mitchell, was introduced and was made an honorary member of the society and responded by some very well timed remarks, very applicable to the occasion. We were all pleased to meet Mr. S. D. Richardson, of Winnebago City, Minn., who in spite of his age and infirmities came down to our gathering to talk horticultural wisdom and give us the benefit of his many years experience. We hope he can be with us many times at our future conferences and we shall always be glad to grasp his hand in friendship.

The following committees were appointed by the President:

On Resolutions—Reeves, Black and LeFevre.

On Premiums—D. M. Mitchell, of Owatonna, Minn.

On Treasurer's and Secretary's Reports—Reeves and Black.

PRESIDENT'S ADDRESS.

C. H. TRUE, EDGEWOOD.

It is pleasant to live in a region that brings to us the four distinctive seasons of the year. Man enjoys changes. We look forward with joyous expectation to the time when each succeeding season shall change the monotony and routine of some fixed form of labor long pursued, and transfer us to some other plane of action, of enjoyment, or prospect. No sooner do the leaves of the forest tree become brown and seared by the frosts of early autumn than the bird of migratory habits, guided by its natural instinct, forsees the coming of winter's chilling ice and winds and hies itself away to some congenial clime there to await the return of springtime when again it seeks the place of its former nesting and early mating. Thus have we been looking anxiously forward to this particular date and season of the year as the home coming time of our brotherhood of horticulturists, a time of general round up of the past

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year's labors, experiences, and enjoyment, and so we have met again to perpetuate a custom that for the past 27 years has called us together in our annual meeting to intensify our interest in the work of our calling —to exalt our chosen profession—to cement more closely the ties of fraternal feeling made sacred by the acquaintance of many years, and yet it is not for our individual interests or enjoyment that we have once more assembled. It is our privilege and duty at this time to make our efforts and influence count for good upon the community in which this meeting is held, to give evidence of the progress we are making, to meet the popular and ever increasing demand for healthful food products that sustain life and bring health and happiness to the multitudes of our land. We trust that both in the rendering of our program, and in the discussions that shall be entered into, there may be much information that shall prove valuable even to our city friends, while they may not be able to enter with us extensively into the practical work of orcharding and of fruit growing, nevertheless find much satisfaction, as users of those things that the practical fruit grower is able to place before them. He who continues long in the work of horticulture is sure to meet with both the successes and reverses which from year to year are repeated over and over again. We will not soon forget the springtime of 1910, nor yet our losses through her failure to fulfill her early promises by the great profusion of blossoms to be seen on numerous fruiting trees and vines. The flattering prospects thus assured were rendered abortive by two sweeping wintry waves that chilled the balmy April breezes, leaving leaf and blossom in its cold embrace. Man's expectation faileth.

But notwithstanding our temporary losses and disappointments, the closing up of the season has brought to us much more than we could reasonably hope for in the line of earthly prosperity and blessings.

Further on in our program, the Secretary has assigned to me the topic "Our Absent Members", but to my mind the present seems an appropriate time to make brief mention of these and their past efforts. While there are many who for a single session have held membership in our Society, there are a very few remaining absent ones who were accustomed to meet with us annually since the Society's organization, until circumstances beyond human control compelled their absence. To such we owe our sincerest sympathy and respect, for they are not absent from choice, but rather from necessity. In justice to them let us hope and believe that their interest *in* and love *for* the things in which we take delight is still intensely felt, and realized in their minds and hearts and lives. Could their highest wish be made known to us at this time, doubtless it would be an expression of good will toward us all as members of this Society and a wish for our greatest prosperity and enjoyment, and an assurance of lasting friendship that began many years ago. It is evident that some of the present working members of our Society will ere long be listed on the roll of absent members, for the swiftly passing years are pressing us closely toward the eventide of life, and to the end of active service. I

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have seen the once sturdy but now dead and leafless tree that had endured the changes of the passing centuries, again clothed with the green foliage and fragrant blossoms of the trailing vine that had stretched itself to the farthest branch of that grand old monarch of the woods, which being in itself apparently useless was still serving a purpose as an object of attraction and beauty. And thus man's usefulness ceaseth not while life endures. Whatever may be the days of the years of that life, or however frail the physical body may become, it remains a force for good or ill upon other lives, and yet stands an objective source around which the clinging vine of some friend's hopes, or childish affection may entwine itself, and receive inspiration and satisfacton and peace. The present condtion and needs of our Society are apparent to all. We have long wished for an increased membership, a greater enthusiasm, a wider influence, an enlarged usefulness. If these things are by any means attainable, they will be realized only when each one of us shall be able to say, As for myself I have endeavored to fully perform my whole duty as an interested party, and to meet my highest obligations toward this Society and its membership.

THE SECOND CROP OF STRAWBERRIES IN 1910.

BY THE SECRETARY.

For some time it has been thundering round the horizon, here and there, that strawberry plants were bearing a fall crop of berries. Many people thought they had discovered new valuable varieties of Everbearers.

It is nothing uncommon for the average market strawberry plant to show this freak of fall fruiting, when the bloom is killed by frost, followed by dry weather. Then when late summer rains come on new fruit buds will develop and bear fruit. The strawberry they grow in irrigated districts called the Oregon Everbearer, is not an everbearer in any sense of the word. In this plant the crop is regulated by proper tilage and withholding the water until time for them to commence growing to mature a crop for the season they are wanted, whether it is August, July, September or October. The season of dry weather the plant goes through gives them a period of rest, then when the water is turned on they grow and fruit the same as they do here after resting through the winter.

Here in this climate, sometimes when the bloom is all killed, and the main plant crippled so that it can produce no more buds, the runners may develop fruit stems that bloom and bear fruit, but as a general thing they are too late to mature much fruit before frost. As a rule these freaks are not fixed and vanish the next season. But there is such a thing as bud variation and the sharp eye of the horticulturist must ever be on the alert to detect such cases when they occur. The bud variation on a Bismark plant produced the Pan American. Mr. Samuel Cooper by watching this sport for a few years and destroying its runners that showed a tendency to relapse he has fixed a permanent type, or as near it as we can ever go, for all plants are liable to sport from the bud. It

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is only by constant care and watchful eye that any plant becomes more fixed in its character as the years roll by, and maintains the good qualities that it starts out with.

There are kinds of strawberries that will bear from June to time of frost, that have been known for centuries. Look at the crusade more than fifty years ago of the Alpine Strawberry, followed later by varieties from France and Germany. All these plants have been growing here together for many years. While many of these imported kinds were too small for our markets and some of them poor color, others were of good size and their runners inherited the faculty of fruiting. Nature makes wonderful crosses. In seedlings no two plants are alike. When the desired plant is obtained it must be kept up to the standard by constant attention to selection. Prof. Bailey says, "Of all the so-called fruit plants, the strawberry runs out soonest and the varieties change the oftenest." Seed production and bud variation result in endless forms of plant life. But having once obtained the start desired, by constant attention to selection, proper cultivation and care in the distruction of all rogues, or non-typical plants, the variety can be kept up to its proper standard. Twelve years have gone by and the Pan American has made good, and is just beginning to be appreciated. It is now known by a few that this plant is a fixed base from which a great race of plants shall rise that will be extremely hardy, the flowers and buds passing through frosts uninjured, that killed the bloom of the common strawberry. Some of its seedlings and their progeny have all the good qualities that it is possible to combine in a strawberry and I have no doubt but that this race of plants will be of incalculable benefit to the people of this country.

AUTUMN STRAWBERRIES.

E. M. REEVES, WAVERLY.

A few years ago we were surprised by having a second crop of strawberries that ripened from August to the time of freezing weather. Beder Wood bore most but all kinds gave some fruit. The cause of this extra crop seemed to be the unusual weather conditions. Through July it was very dry and then came an abundance of warm rains; these started fruit buds and gave a small crop of fruit of exquisite flavor but not as strong as the usual crop, ripened in warmer weather.

The beds that bore the fall crop gave very little fruit the next season but this set many of us to dreaming of a strawberry that would bear all summer and I selected plants with a view of encouraging this trait. No results came of this as the plants returned to their normal habits. However, we were prepared for the announcement of several growers who offered varieties of everbearing tendencies. Several were tried but with little success. As I had about given up all the sorts I know of I was surprised by the appearance of several quarts of berries sent to the State

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Fair by Mr. H. Rockhill of Conrad, Iowa, these were a promiscuous lot of seedlings as the variation in color, shape, size and flavor indicated. They were small to medium in size and some were of excellent flavor. Mr. Rockhill stated that he began planting seed about 1896 with the object of producing everbearing sorts. He sent out no plants until last spring when I was favored with a few of each of his four leading sorts. These all grew well and bore at the usual time for strawberries. They continued to bear without interruption until a hard freeze the middle of October put an end to their growth. At that time the plants were well loaded with blossoms, and berries in all stages of growth. The fruit was of good quality all the time and one sort especially was very fargrant. The plants make runners about as do the common sorts. At the 1909 State Fair Mr. Rockhill again showed his fruit but of only a few of the best varieties. Others may secure such results but this pioneer certainly has something worth while and he has not lived in vain. It is to be hoped that some plans will be made to give the public the benefit of these delicious berries without unnecessary delay. Many new things are of questionable value but this is not of that number and when plants can be obtained they will be generally planted and remain always in public favor.

HISTORY OF THE PAN AMERICAN AND AUTUMN STRAWBERRY.

BY SAMUEL COOPER, DELEVAN, N. Y.

The first Pan American strawberry plant was found by me in the fall of 1898 growing in a row of Bismark plants set the previous spring. This plant had made sixteen runner plants all of which had either ripe, green fruit or blossoms on them. The old plant was heavily laden with fruit. I marked the plants and in the spring of 1899 took up all of the young plants and set them in the garden where I could watch them more closely than in the field. The old plant was left to fruit that spring and after fruiting was taken up and divided into ten plants and set in the garden with the others. They blossomed that fall but were not allowed to fruit. Of the sixteen young plants, set in the spring, two were destroyed by grubs and two others were destroyed as they did not seem to be growing well. The fruit stems were removed from the twelve remaining ones until July first then allowed to fruit. All fruited from August 4th until November. These twelve plants had increased to one hundred and twenty. Forty-four of these were set in a new bed October 1899. Seventy-six were set April 16, 1900. The ten from the original plant were allowed to fruit in the spring of 1900 and were not divided and re-set until the spring of 1901. Of the one hundred and twenty all lived and were given extra care and stimulated with liquid-manure. Four of them made about 30 to 40 plants each but did not fruit in the fall. One made about five hundred new plants not one of which ever fruited in the fall. All of these and those that made thirty or forty plants each were kept separate from the others. All fruit stems were removed until July 1. They produced

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as follows including a few from the ten old plants, August 340 oz., September 691 oz., October 406 oz., November 31 oz. In the spring of 1901 they were all taken up and set in the field. There were 1,300 after taking out those that seemed to have reverted. Of the 1,300 all fruited except four which were destroyed. For a few years occasionally one would make runners freely and not fruit. These were destroyed with all their runners. I do not think one plant has failed to fruit for the last three years. The Pan American is undoubtedly a sport by bud variation from the Bismark.

THE AUTUMN.

This is a pistilate and is a seedling of the Pan American. I planted a lot of seed either in 1903 or 1904 (I did not keep a record) I had about 500 seedlings from these I saved only two. One I called "The Cooper" and the other "The Autumn." Very many of the other seedlings were fall bearing but not good enough to bother with. The next season I raised about 500 more seedlings from Pan American seed. Saved only one "The Sherman." This was not a fall bearer. So it can be seen that the Autumn was one good fall bearer out of a 1,000.

One year ago (1908) I sowed Sherman seed mated with Cooper, both being Pan American seedlings. I have saved about 200 of the most robust plants and shall set in the field. I found two among them that bore nice berries last fall, showing that they have inherited the trait from the Pan American. You could probably get some information from H. Rockhill of your state on fall bearing berries. He bought Pan American of me to breed from. I think the Pan American is the first American fall bearing berry in existence. The Cooper (staminate) and the Sherman, which is a pistilate are my main dependence for spring fruiting, as they have proved the best money makers I have found although I have tested about one hundred varieties. I continue to test new varieties as they come out. This year I have Fendall, Heritage, Norwood, Iona, Markett, July, Black Beauty, Barimore, Kevitt's Wonder and others. I find most of the highly praised varieties fail when tested in the field with only ordinary care. I have about 500 new fall bearing varieties to test this season (1910). Two years ago I sowed four quarts of "Autumn" crossed with Pan American and Cooper (close in-breeding) several thousand came up and were left thickly in the rows and allowed to rough it, so to speak. Three quarters of them winter killed or were crowded to death. Of those that lived some appear very promising, time will tell. I would like very much to attend the annual meeting of your Society at Cedar Falls but am unable to do so at this time and I send you all my best regards and hope you will have an interesting meeting.

St. Anthony Park, St. Paul, Minn., Jan. 31, 1910.

Mr. Chas. F. Gardner, Osage, Iowa.

Dear Sir: Yours of January 26th at hand. In regard to everbearing strawberries, ten years ago I visited the grounds of Vilmorin-Andrieux & Co., of Paris. At that time they had growing a small patch of the autumn

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fruiting strawberry, known as St. Anthony de Padua, which is said to come true from seed. I saw them in August, and at that time they were well loaded with a good crop of large fruit. I obtained seeds of it, and from them grew several hundred plants that bore more or less fruit in autumn. The autumn fruit was much the best when the spring flowers were removed. I thought them not quite so hardy as some of our common kinds. While they did not come true from seed, yet there was no wide variation, nor did we find the Alpine class especially prominent.

We are growing some of this class of strawberries at our fruit breeding farm, and are making a point of crossing them with our best hardy sorts, and hope in this way to unite hardiness in plant with autumn fruiting qualities. I think there is a good field for a berry of this kind.

With kind regards,

Sincerely yours,

SAMUEL B. GREEN.

EVERBEARING STRAWBERRIES.

Lake Mills, Wis., December 17, 1910.

Mr. President and Brethren—I would be delighted to be with you, but we are just about to start for Texas for the winter. I have been trying Pan America and Autumn for three years. The first year I set them out to bear, and they bore themselves to death; the next planting one bed of Autumn made plenty of runners, another bed near by on similar soil did not make a plant, but continued to stool out till as big as half a bushel, and this last summer one of those hills had 301 berries and blossoms on at one time. Another bed of Autumn, set last April, made plants and bore freely.

The Pan America do not make plants. I have divided stools to some extent. What we want is a perfect flowering sort that will make runners freely and be as productive, to put beside Autumn, then we can raise strawberries to sell in October.

Wishing you success and a prosperous meeting, I remain,

Truly, *truly*, *TRULY*,

GEO. J. KELLOGG.

LATE BEARING STRAWBERRIES.

EDWIN H. RIEHL, ALTON, ILL.

That the king's crown rests finally on the strawberry, in reference to small fruits, cannot be justly disputed. Then it is no wonder that since the first efforts in the cultivation of this berry, persistent attempts have been incessantly made to extend its short season of ripening.

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Originally the ripening season was not to exceed ten days. Later the Gandy was added which made the season a few days longer, and the latter is still largely grown in many sections.

Some fifteen years ago a New Jersey grower who understood something about plant-breeding and recognized the good qualities of Gandy, began crossing this with other varieties of superior character, and the outcome of this was a list of varieties known as Blacks' Pedigree. Among them were Robbie, Joe, Nettie, Dr. Fisher and Mrs. Fisher. These all showed Gandy blood and especially in the vicinity where they originated, were considered of much value. All but Nettie were of about the season of Gandy. Nettie added several days to the Gandy season. It was a pistilate variety, large, light color, productive, with only fair quality. About the same time a variety called Hunn, came out with a season even a little later than Nettie, also a pistilate, very productive, large at first to small at the end of its long season, firm and of very good quality. Rusts badly in many places.

Several foreign varieties were tried which in their home environments have a tendency to bear perpetually or at intervals throughout the season. Here, while they showed a tendency to repeat, they were not congenial with our soil and climate and for lack of vigor were a failure, with the exception of one French variety which came to us three years ago.

Some twelve years ago Mr. Samuel Cooper of New York began work along the line of extending the season of fruiting and secured a variety which he named Pan American, of real value, under certain careful culture a very strong plant, that was truly perpetual. Its faults were, poor quality and a very slow plant maker.

Mr. H. Rockhill of Iowa then took up the work crossing the Pan America with our best native sorts and the outcome of his work is of great value and truly revolutionize strawberry culture. The writer has thoroughly tested several of Mr. Rockhill's truly perpetual varieties and will not hesitate to give his honest opinion, that in this new creation we have what might be called the greatest advance in horticulture that has come before the public since the writer's early inspiration to his noble vocation. These berries are positively perpetual, bearing every day from May until after frost. On this first day of November we have individual plants bearing fifty and more berries in various stages of development, and blossoms. There are hundreds of plants full of blooms and berries. Two of these are named and placed in the hands of a few plant growers for sale. Americus, is the best one, plant is remarkably vigorous and healthy and a free plant maker, fruit large, firm, roundish, uniform shape, bright red and has the true wild strawberry flavor. Bears, not as some might suppose, now and then a few berries, but produces in quantity from May until winter.

Francis. Good healthy plant and a free plant maker; too persistent to be a success in the hands of the greedy amateur. Sometimes the little runner plants bloom before rooted in the ground, and when rooted they never know when to stop. Naturally it depends upon the growers wisdom to assist nature a little by occasionally disbudding to give plants a rest

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and also to do some feeding at intervals during the season. This done the variety will give good results. The fruit is large, bright red, glossy as though varnished, quality very good. Season from May until severe freezing weather.

Rockhill No. 6 has all the points of a commercial variety like Ben Davis apple, but not unlike this apple it is a little off in quality. It gave us berries from May till frost, the past two seasons. A moderate plant maker.

No. 11. Is the largest of the Rockhill class. We picked berries in September and October as large as the average Bubach and Sample, a constant bearer and slow plant maker. Fruit sometimes mis-shapen, firm, of good color, fine quality and fair producer.

Rockhill's No. 10 is not perpetual, but is a fine late business berry in the regular June season.

Rockhill No. 7. Is constant with us, rather small and noted for its extra fine quality.

Rockhill's No. 12. Very vigorous and a free plant maker, bears right along all the season, but as it were has wisdom enough not to bear itself to death. Medium size, firm and of good quality.

Rockhill No. 9. Bears a few small berries all through summer and fall, but its merits do not indicate success as compared to the above.

Referring again to Mr. Cooper of New York, the founder of this class, he has in the meantime not been sleeping. Several of his new seedlings are being tested here at Monarch Fruit Farm Station and show great promise. His No. 7 bore right along from June till November. Not in great quantity and the same may be said of his No. 4. The plants of both are very healthy and vigorous and send out runners freely. Fair quality and blood red from skin to center.

Several other varities from Mr. Cooper are in our station for trial, but another years fruiting is necessary to give them justice. So much for the good work of others. Now we will refer briefly to what is going on here at home in the way of improving the King. A strawberry crank from childhood on; responsible for the Ruby, introduced many years ago and still on the market, naturally fell in line when the new perpetual creations started. I have now two hundred named varieties of our own origination in the test plots, one hundred are at this time, (Nov. 1) loaded with berries in various stages of development, and blossoms. The most remarkable one of these we named W. P. Stark. Seed of this one germinated in March, six weeks later bloomed, bore beautiful berries in June, perfect in every respect. The parent plant bore all summer and at present plants sixty days old have sixty berries and blossoms to the plant. Other promising ones in this lot are Alpha, Alton, Mayne, Ranger Robin and Radiance. Parents of all have been bearing since June and sixty day old runners are loaded with fruit and blossoms at this time. In the mind of the writer it can be no other way that the once a year bearing varieties must soon be discarded to make way for the perpetual creation. In regard to the culture of this new class it does not differ from the way any variety should be grown. The best growers in many sections are now

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using the hill culture and hedgerow methods, and that is the way this class should be grown. It should also be borne in mind that such generous plants should be literally fed and culture should be thorough. While they are the first to ripen, it is a good plan, while they are grown in connection with the ordinary class to disbud for a few weeks so they will come in for a heavy crop when the others are gone.

It is also advisable to disbud alternately at intervals a section of the field, so that while one section is bearing the other is resting. It is well to have about three sections in which this method is practiced. In this way heavy pickings can be made daily from May till frost. With this wonderful improvement in our favorite berry it would not be surprising if in a few years the apple should take a back seat as the king of fruits.

EVERBEARING STRAWBERRIES.

L. J. FARMER, PULASKI, N. Y.

My attention was first attracted to this type of strawberries by the receipt of a baking powder box full of them from my old friend, Samuel Cooper of Cattaraugus county, N. Y. Mr. Cooper wrote me that he had found a fall bearing runner, a sport from the old Bismark strawberry, growing on his grounds; that he had propagated from this runner and that the characteristic of bearing berries throughout the summer and fall was fixed. Well, I was not very deeply impressed but I wrote him my opinion and acknowledged the receipt of the berries. The year of the Pan-American Exposition at Buffalo, Mr. Cooper had a good display of these berries at the Exposition and the berry was named "Pan American." The Pan American is self fertilizing. Another seedling of Mr. Cooper's is "Autumn," a pistillate, which is not so valuable as a fall bearing sort, but is enormously productive when fruited in the regular strawberry season. I was particularly impressed with the value of the Pan American strawberry by seeing the large and fine exhibit of the fruit at the New York State Fair a year or so later. Since this time I have handled thousands of plants of this variety for Mr. Cooper and other growers, and I understand the demand has been so great that it exceeds the supply every year, although the wholesale price is fully forty times that of ordinary strawberry plants.

The Pan American strawberry plant is just as persistent in bearing a crop of strawberries in the fall as other varieties are in the spring—in fact, more so. You can hardly prevent them from bearing. You pinch off the fruit stems and more will appear in a few days. If you cut off the blossoms of an ordinary strawberry, that is the last of it and you get no fruit the same season unless there is an extreme drouth or an unusual spell of weather that will interfere with normal growth.

The Pan American is the first of a new race of strawberries which will be known as "everbearing strawberries," and which will revolu-

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tionize the strawberry business. There are many people who prefer fresh strawberries to any other fruit and when they find they can have them on the table from June until December—nice large strawberries and plenty of them—the demand for this class of plants will be enormous. While the Pan American has great value, it has many faults and will soon be surpassed by larger, more productive and better varieties. One thing in passing, I wish to mention, and it is this: The public should never forget that Mr. Cooper is the originator of this type of strawberries and deserves great credit for developing and putting the Pan American on the market. The everbearing strawberries are far more valuable than many kinds of fruits that are heralded as godsends to mankind. Mr. Cooper keeps on experimenting and now has several new seedlings coming on which promise great value. One, a pistillate, he claims will bear more fruit in the fall than any everbearing strawberry ever produced. He has sent me photographs which seem to prove his claims.

Others are working along this line, but Mr. Harlow Rockhill of Iowa, seems so far, to have attained the greatest results. My attention was first called to his work by the receipt of a letter from Matthew Crawford, the great strawberry expert of Ohio. In this letter Mr. Crawford told me that Mr. Rockhill had solved the problem of having strawberries all summer. I began correspondence with Mr. Rockhill with the result of his sending me 6 plants, each of four varieties, in the spring of 1909. These grew nicely and bore fruit all through the summer and fall.

BEST VARIETIES OF STRAWBERRIES FOR MAIN CROP.

G. D. BLACK, INDEPENDENCE.

This is rather a difficult matter to decide. There have been hundreds of varieties introduced to the public, and with few exceptions each one has been claimed as best.

I suppose that most of these claims have been sincere. There are very few varieties that will succeed on all kinds of soils and under all conditions. The only way that we can determine the best varieties for each particular location is by testing them, and the prudent man will buy only a few plants for testing. We have tested more than a hundred varieties and found only a few that succeed on our place well enough that it pays us to grow them for market.

I will mention the principal merits and defects of the following varieties that have been profitable with us. Warfield is the variety that we recommend for the family strawberry bed. It is a great yielder of medium sized berries of best quality. It has a long season of ripening. If the mulch is removed from part of the bed, you will get your earliest berries there, and the part from which the mulch was not removed will bear nearly as late as any. It has an imperfect blossom, and must be fertilized by planting every third plant or row with Bederwood or Dunlap.

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Bederwood is a good yielder, but the quality is not so good as Dunlap. We retain Bederwood in our list as a fertilizer for Warfield because it is not so liable to winter injury as Dunlap if mulching is neglected.

Dunlap is of very good quality, like its relative the Warfield, and succeeds well on heavy loam or clay soil. It has not given us paying crops on a rather light soil.

We plant Haverland quite extensively for a home market, and use Clyde as a fertilizer. The quality is only fair, but their large size makes them nice berries to pick and sell. They are soft and light colored and must be picked before too ripe. They rot badly on low wet locations during a rainy time.

In order to have large berries near the last of the season when the earlier varieties are small, we plant some Sample and fertilize them with Gandy. Sample is medium late and yields well. It is the most beautiful in color and shape of any berry we grow.

Gandy is a shy bearer but a good berry. We have tested quite a number of varieties claimed to be later, but Gandy is still champion in a slow race.

HOW TO SUCCESSFULLY TRANSPLANT STRAWBERRIES AND OTHER PLANTS DURING THE HOT SUMMER MONTHS.

M. H. WETHERBEE, CHARLES CITY.

How to successfully transplant strawberry and other plants during the hot summer months.

While to answer the above subject is easy, it may take more work and expense than the average horticulturist will care to take, but there are others who can and will make a good thing out of raising strawberry and other plants in common florist flower pots, and the sale from same will pay well for the extra care and expense attending same.

To raise good pot strawberry plants, you should have a bed producing a fine lot of runners, when common greenhouse pots should be filled with soil, sunk into ground to the level, and a new plant at end of runner fastened into same, a three-inch pot being the size best suited to that work to give a good, strong plant.

To make a success of pot plants, you must be so fixed that you can use plenty of water to keep the plants from drying out in the pots, as neglect on that part would stunt and ruin the future usefulness of the plants. When the pots are well filled with roots, the plants can be detached from the parent plant, and are ready for sale or replanting, or can be kept for a while in a cold frame till disposal of same to advantage. The plants can be taken out of pots with a good ball of earth and roots that will stand shipping for a distance in hot dry weather, or will stand a considerable drouth when set out, but should be well watered when set out, and will need little if any shade to start same.

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Now, the practical question may come to some, will it pay? I can only reply by giving you some of the prices of that old established firm of Peter Henderson, quoted on pot strawberry plants the past season:

Bederwood, 50 cents per doz., $4.00 per hundred, $30.00 per thousand.

Great Ruby, 75 cents per doz., $5.00 per hundred, $45.00 per thousand.

Cardinal, 60 cents per doz., $4.00 per hundred, $35.00 per thousand.

The season that strawberry pot plants are on sale is July 25th to Sept. 15th, and the earlier planted with good care will insure the success for the next year, but plants set during that time should give from a fair to a good crop the following season.

Then, to the horticulturist, there is the possibility of making much out of little in the way of propagating new varieties, and getting up a large stock of some valuable variety.

Today, there is a demand for many plants from pots among the perennial class on account of the ease and success of planting, also the same may be said of tomato and other easily raised plants.

PLANTING THE FAMILY FRUIT GARDEN.

G. D. BLACK, INDEPENDENCE.

Many families do not have and enjoy home grown fruits because they have become discouraged by failure on account of improper planting.

Many mistakes of this kind have been made and would sometimes seem laughable were it not for the serious disappointment of the planter.

A neighbor who had bought blackberry plants in the spring, asked us in August to go and examine them. He said they were all dying. He had planted the plants six or eight inches below the surface of the ground and the new growth had been unable to force its way through the soil. The portion of old cane that is usually left on the plant to facilitate handling had naturally died at the usual time. Asparagus plants are often smothered in the same way.

Another party went to the opposite extreme by setting his grape vines so shallow that the middle and upper series of roots were left dangling in the air. Another man said he had probably killed his trees with kindness, by placing a quantity of barnyard manure around the roots when planting them. Others have shown their kindness by feeding each tree a peck of oats or potatoes. Another customer who wanted his trees replaced had planted them so loosely that the horse in nipping at them during cultivation had pulled some of them up. He said that they died after being replanted, but he thought they would have died any way as some of the others did. Many failures of this nature could be cited, but a few brief rules that have been successful with experienced planters will be of more value.

Rule 1.—Never expose the roots to the wind or sun until they become dry.

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Rule 2. Place the roots in the ground in their natural position.

Rule 3. Never place anything except good moist soil in contact with the roots when planting.

Rule 4. Firm the soil well to the roots by tramping with the feet.

Rule 5. Keep the surface of the soil loose and free from weeds so as to conserve the moisture in the soil.

If these rules are strictly observed by the planter, he will be reasonably sure of success and a good growth will result.

If the garden can be located so as to have it in a few long rows, it can be more easily cultivated and most of the hoeing which deters many from having a good garden can be avoided.

While waiting for the trees to become of bearing age, the young orchard can be used to advantage for growing small fruits, sweet corn, potatoes, vegetables, etc.

Apple trees should be planted in rows running north and south, if possible, so that the trunks of the trees and the ground will be shaded during the heat of the day, and not closer than fifteen to twenty feet apart in the row. There should be at least two rods space between the rows and the same distance to other trees adjoining the orchard on the east or west.

A good thrifty tree four or five feet high is better for planting than a larger size. It is a mistaken idea that a large tree will come into regular bearing sooner and at the same time make a good thrifty tree.

Unless it is raining when ready to plant, keep the roots of the trees wrapped in wet blankets, or cover them with moist soil, and take them out one at a time, as you are ready to set it in the ground. Trim off any broken or bruised roots just before putting them in the ground. Dig the hole large enough that the roots may be placed in their natural position. Never bend them. Here where trees are liable to root-killing by severe freezing when the ground is bare they should be planted from six inchs to a foot deeper than they grew in the nursery unless the ground is low and wet. Then they had better be mounded up to this height or more for several feet around the tree.

This deep planting will cause the tree to grow new roots above where it was grafted and they being of the same hardy variety as the tree will be able to withstand severe freezing.

Cover the lower roots with two or three inches of moist surface soil. The subsoil that is dug from the bottom of the hole contains very little plant food. Work the soil among and under the roots with the hands and then firm well with the feet. Be sure that the soil is packed well under the roots as well as on top. It is not necessary to use water when planting, if the soil is quite moist. Fill the hole nearly full and tramp hard again and finish with fine loose soil without tramping. If you lean your tree slightly to the south, it will probably be perpendicular when large, as the sun causes it to grow toward the north. If each tree is not pruned soon as planted in proportion with its roots, you may forget and not know how much to prune each tree later.

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The limbs should not be left closer than about six inches on the body of the tree and pruned back half or two-thirds of their length. Do not cut back the center growth.

Plum and cherry trees should be planted closer than apple trees, as they do not grow so large. Many advise planting plum trees in the chicken yard. Cherries do best where the soil is not naturally wet.

Berry bushes, currants and gooseberries, may be planted in the apple tree row, as they do best in partial shade and do not harm the trees until they begin bearing. They should be planted three or four feet apart in the row and deep enough so that the crown, which is the place where the roots are united to a tree or plant, will be about four inches below the surface when the ground is leveled. Always firm the soil well to the roots, but be careful to cover the crown lightly with loose soil until the new growth is a few inches high, when the ground may be leveled up when hoeing. Many black raspberries have been ruined by neglecting this precaution.

Plant grape vines from six to eight feet apart. Holes in which to plant them should be eight or ten inches deep, and about two feet in diameter. Shorten the roots to ten or twelve inches and place in the bottom of the hole like the spokes of a wheel, and proced as in planting trees.

The top of the cutting from which the vine has been grown should be a little below level with the top of the hole. Cut most of the vine away, leaving only a few buds, and drive a stake or four foot lath beside it to which the new growth may be tied the first season.

Plant strawberries eighteen or twenty inches apart in the row and have the rows three or four feet apart. A hundred plants will set a row about ten rods long. The ground should be well firmed and smooth as a floor, as in no other way will you be able to set the plants at just the right depth, which is very important, so that the top of the crown from which the leaves start is about half an inch below the surface.

We make the holes for setting strawberry plants by putting a spade about six inches in the ground with a slightly rotary motion, making the opening at the top about two inches wide. Take hold of the plant with the crown between the thumb and fingers, and with a swinging motion as you place it in the hole, the roots will be spread out in the shape of a fan. This is much better than leaving the roots in a bunch, as when planting with a dibble. At the instant the plant is in place, a pressure of the foot at the side of the hole will cause the earth to hold the roots in position. Then with all your weight on the heel of your shoe, tramp twice at the side of the hole, so as to pack the soil firmly to the roots, and entirely fill the cavity made by the spade. Finish by smoothing the surface of the soil and keeping it fine and loose by shallow cultivation. While planting, the roots of the plants, but not the tops, should be kept wet in a pail containing about an inch of water.

As my time is limited, it has been necessary to omit many of the details, but anyone by the exercise of good common sense, and a close adherence to the five rules that I have mentioned, need have no fear of failure in planting.

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THE NEW HARDY ROSES.

CLARENCE WEDGE, ALBERT LEA, MINN.

One hardly feels like beginning a paper on roses however short or limited in treatment, without bestowing some word of appreciation of the wonderful flower that has for centuries been the boon companion of the human race the world over, and has without a doubt brought more joy to the heart of man than any other floral gift of the Creator. In our travels over the great plains of the west we have been surprised and delighted to find this friend of man staying with us like a dog wherever we went. In June it fairly reddens the creek bottoms of cold Alberta, growing in miniature forests where nothing else but prairie grasses can be seen as far as eye can reach. And we have found it growing in dwarfed form with fern like foliage on the tops of the buttes of the Dakotas, coming up perhaps among a cluster of cactus and exposed to the full force of the western siroccas. It is said that the rose prefers a clay soil, but some of the choicest of the wild roses we see growing in banks of sand. We hear that the rose demands a sunny situation, but do not all of us remember the natural climbers of the copses that seem to delight in stretching up through the underbrush and lifting their blushing clusters among the plum and thorn trees?

The rose shows such a wonderful ability to adapt itself to all conditions of soil situation and climate, and withal is such a favorite everywhere, that we are led to think that we of this favored land between the two great rivers have but begun to realize the possibilities of this queenly flower about our homes. We have but to combine in one the best qualities of each of the roses that can be made to grow with us; the color, the fragrance, the glorious form, and the dog-like willingness to stay with us in any place, and we have the floral triumph of our day. The roses that we have been growing for years past have each of them some of these qualities. The Hybrid Perpetual class has the form, the fragrance and the richest of coloring but requires the most delicate care and petting in order to keep it with us, and in the hands of the average planter is little better than a continual disappointment. The June roses are fine as long as they last and some of them are fairly hardy but their season is short and eleven months is a long time to wait for roses again. The Siberian or Rugosa roses have the healthiest, richest foliage and are hardy enough to stand in Manitoba, and some of them bloom all summer, but they are mostly single and lacking in form of bud and bloom. A combination, a merger, if you please, is what is needed to keep up with the demands of our people. This is a work worthy of the highest talents but it is also one that may be carried to a successful issue by the most untrained worker in the soil if he has the enthusiasm and patience to carry it to a conclusion. We would feel that this paper had not been written in vain if we had stirred the thought of but one toward working out this most useful and interesting problem.

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But more has been already accomplished for us perhaps than many of you know of. And strange to say it has been done in sunny France where the climate demands nothing like the hardy qualities in a plant that must be found in everything that thrives with us.

The Siberian rose with its rich and healthy foliage and magnificent single blooms seems to have attracted their attention and made them wish to introduce some of its robust health and vigor into their more cultivated forms.

One of the earliest results of these French experiments was brought out by Bruant in 1888 under the name Madam Georges Bruant. A white rose that shows some of the fine foliage and hardiness of its Rugosa parentage, and from the other side took its pointed bud, long stem, and semi-double blossoms.

Four years later the Blanc de Coubert, another white rose, was brought out by Cochet, another French rosarian. This fine variety retains all of the robust foliage and abounding health and hardiness of its Rugosa parentage. Indeed it shows very little admixture of the cultivated varieties, and may be a simple sport from the native species. We have had it on our grounds in Minnesota from almost the time that it was sent out. It is a pure paper white, of exquisite fragrance, rather better than semi-double especially if given good cultivation, and the freest bloomer from June to November of anything we have had on our grounds except the little Baby Ramblers. Hardly a fair comparison this, however, between a rose that is frequently four inches in diameter and the little miniature Polyantha roses.

Sir Thos. Lipton is another valuable white rose of this class. Its foliage is of the darkest, richest green, and it blooms as double as the Madam Plantier. Indeed so much does it resemble this old time favorite that it might with propriety be called an everblooming Plantier. However it is far hardier than the latter, blooming well without protection although it will be cut back some each winter. One of the best of its class.

The Hansa is not perhaps quite as free blooming as the last two varieties, but there is not a week in summer when blooms can not be found on the bushes. We should have said that all the roses of this class are inclined to bloom in clusters, and in the Hansa several buds in a cluster are inclined to open at the same time which at a short distance gives the effect of one immense rose. Like the Blanc de Coubert the Hansa carries the foliage of the Rugosa and is entirely proof against the severest winters. Its color is a deep red, perfectly double, and very fragrant.

The Rosarie de la Hay is a variety that closely resembles the Hansa, but is of a brighter red and not inclined to have its clusters bloom all at once. It appears to be fully as hardy as any on the list.

The New Century is a pink rose of many remarkable traits. Its foliage lacks something of the best of the class, and in wet years we have seen it somewhat affected with the leaf troubles that nearly destroy the usefulness of the old line roses. It is at least thirty per cent hardier than the Madam Plantier which with us kills to the ground every winter if

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not protected. In color it shades from a clear pink in the outside petals to a bright red in the interior. It is perfectly double and of the most exquisite fragrance of any rose we grow, blooming with great freedom till cut by freezing weather.

One of the most valuable of this class of roses, and one that is worthy of planting anywhere that roses can be grown is the Conrad Ferdinand Meyer, introduced by Muller in 1900. This rose shows but little of its Rugosa parentage except in its large foliage which has a trace of the fluting found in the Siberian sorts. With us it has proved only about as hardy as the Madam Plantier but its blooms will compare favorably with the best of the Hybrid Perpetuals, and its vigor transcends any of them so that we have in it a Paul Neyron that does not have to be petted and coddled and replaced every few years. Which we think will appeal to many of you as qualities that are quite worth while. Its color is a clear, silvery rose, fully double, and it will bloom freely throughout the summer even if cut to the ground by winter frosts.

There is a much longer list of these new hybrids, some of them quite tender and showing very little of the Rugosa blood in their makeup, and others very hardy and good for us to plant but blooming but once in the season. We have mentioned only those which we have given a thorougth trial. We hear of the beauty of the rose hedges of the Pacific coast and no doubt many of us have wished that we might enjoy such a floral luxury. Such varieties as the Blanc de Coubert, Hansa, and the Rosarie de la Hay are as hardy as could be desired for this purpose and with good cultivation would be in bloom from June to November, making as attractive a show as anything grown in any climate. In a word, this new class of roses opens up to all our people the opportunity of having roses all summer on the same terms that they are had by the gardeners of any climate. And it seems to the writer that we nurserymen ought to wake up to the fact, and see that they are distributed in the place of the old list that is so unreliable even with expert care and altogether unadapted to the needs of the average planter.

Those that attempt to propagate them will find that most of them grow readily from layers, and that their foliage is so much healthier than the old line roses, that they can be grown much easier, and last but not least, that they ripen up their wood so much better that when they are placed in winter storage some assurance may be felt that the count will hold out when the bunches are opened up in the following spring.

WHAT THE PAST YEAR HAS TAUGHT US.

JOHN HARTER, LOCUST.

The spring of 1910 was a remarkable one. The prospect for a fruit crop was very good, but on account of the warm early season everything started to grow almost too early for this party of the country.

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I have never seen trees in full bloom at the first of April in the last twenty-eight years since I lived here. Shrubs and berries were about a month ahead of time, and, as I said above, the prospects for a fruit crop had never shown more promising before, but we can never count the chickens before they are hatched.

At the 15th of April, the weather turned colder and on the morning of the 16th, the mercury showed from 16 to 20 degrees below freezing, and we horticulturists know what this means when trees are in full bloom by such a temperature, and what was left on that date Mr. Jack Frost grabbed with his icy fingers the 23rd of April, when the mercury went down to zero in some localities. But keep up hope, where there is no hope no more. Whoever would believe that trees and berries that had been in full bloom and entirely killed by frost, would come out two months later, about the first of June, with a full set of blossoms. This is a lesson for horticulture to study on what nature can do. It is remarkable to see the same trees in full bloom the first part of April, and then again the first part of June. Not only the frost in the spring, but the long drought which we never had in this part of the country, will give the horticulturists a test of the hardiness of varieties that will withstand all kinds of weather more satisfactorily than others; therefore, it must be our duty to try and give such varieties more attention and put all our efforts in the work to raise hardier varieties.

I have noticed that some varieties from one to three-year-old trees were entirely killed, 100 per cent, where others just beside them were ranging from 10 per cent to none at all, and this proved to me that trees that were claimed to be hardy like the Northwestern Greening are not hardy enough for Northeastern Iowa. Of the oldest varieties, the Wealthy seemed to me to be one of the hardiest trees I had on my place. A few of my own seedlings stood the test better than any old varieties, especially the Harter's Red. This tree is one of the hardiest trees and the heaviest bearer of all my seedlings.

If the audience wishes to hear the record of this tree, I will read it to them.

RECORD OF HARTER'S RED.

JOHN HARTER, LOCUST.

This tree was grown from seed of a Duchess by John Harter, near Locust, Winneshiek county, Iowa.

This young seedling tree was transplanted when about three years old in the year 1900 on the edge of a stone quarry. It made a nice growth with hardy, thrifty foliage, never blighted.

In the year 1903, it bore its first apples of dark red color, with fine aroma. The fruit hangs in bunches up to six and more apples in one bunch. It is a late fall apple.

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Its first bearing in the year of 1903 amounted to about one peck. In 1904, about two bushels; in 1905, some over five bushels; in 1906, two and one-half bushels; in 1907, some over three bushels. In 1908, the tree was loaded heavier than ever before. Some limbs had split off before the 20th of June, on which day the crop was destroyed by hail.

In 1909, only a few limbs underneath, which had not been injured by hail, brought a few apples. One bunch of six on a limb, about half an inch long, went to the State Fair. One limb of three inches long, with fifteen apples on it, was shown in the Winneshiek County Fair.

In 1910, the same tree blossomed like a snowball tree, but was destroyed by the frost on the 16th of April, with the exception of six apples.

PEARS FOR THE NORTH.

C. G. PATTEN, CHARLES CITY.

I am not able to give a long list of pears suitable for a northern latitude but I think I may name a few sorts that we may rely upon as being comparatively hardy and, in a measure, profitable to propagate.

I got my first idea of the possibilities of pear growing in the north in 1864 in Wisconsin and from the now deceased Capt. R. P. Speer of Cedar Falls. About twenty-six years ago, I made a canvass of the states of Illinois, Iowa, Kansas and Wisconsin in an effort to ascertain what those states were propagating in the line of blight proof, hardy pears—for these two things are the weak points in the pear and these qualities must be improved upon if we shall ever be able to secure trees suitable for the extreme changes of our Mississippi Valley latitude.

In my researches, I had decided that the Longworth and Chinese Sand Pears were a reliable foundation to build upon but, that we must have better quality, so I included in this group, which was planted far away from other pears, the early Bergamot, Seckel, Anjou, and later the Lincoln and Bessemianka, afterward cutting out the last one on account of its early blighting characteristic. But the Chinese Sand Pear blossomed about ten days in advance of the others and bore a few, small, hard specimens, while its supposed fruit sent from New Jersey was fine in appearance and resembled somewhat the Flemish Beauty. Of course, this was a great disappointment, but the tree proved perfectly hardy. The tree of the Seckel held on until I was able to secure some seeds which I planted and, from them, obtained seedlings that are about ready to bear.

There is still another desirable pear that took the name of the disseminator, Mr. N. K. Fluke. The Longworth and Fluke are about equal in hardiness, and the latter is entirely free from blight, while many others blight badly under equal conditions. The Fluke is better in quality than Keiffer or Longworth, and a good bearer; putting these several good qualities together, I proceeded to cross-breed the better ones upon No. 15 and Chinese Sand with the hope of combining the best qualities of both

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sorts. I think I should not take my chances with Longsworth pollenated with Flemish Beauty and Fluke with reasonable expectation of obtaining good results, as the Longworth has grown to large size with C. F. Gardner, of Osage, and the Flemish Beauty is the hardiest of all the old good pears. I have seedlings crossed with Anjou, Seckel and a Russian Pear (No. 15), and also seedlings of a cross between Winter Nelis and Keiffer —but Winter Nelis—I would not make this latter cross again as the fruit of this cross is too small and it is too tender in tree. I now have these several seedlings—upward of two hundred—many of which give real promise of hardiness.

I believe that the nurserymen of Iowa, Wisconsin and Minnesota should be growing such sorts as Fluke, Longworth and Flemish Beauty for I am convinced that we shall be able to produce desirable pears as well as apples in these latitudes, and that in the not distant future we shall have secured trees that shall be both hardy and blight resisting.

A part of my future efforts will be in the direction of establishing a more complete foundation for successful pear growing in this region and the middle northwest. My work in all these years has been wholly unremunerative and yet I feel amply rewarded in realizing such beneficial results as have already crowned my efforts. If our nurserymen would plant Russian Pear No. 15 and Chinese Sand Pear, then cut them back to the ground and graft with Fluke, Winter Nelis, Flemish Beauty and others that we will learn of, they might supply their customers with trees that would produce desirable pears, even in this northerly climate, and, while this is being done, our people can, and our experiment stations will, be breeding hardy, blight-resisting pears which will ultimately make this delicious fruit one of the permanent horticultural products of our state.

HARDY SHRUBS.

B. F. FERRIS.

The snowballs, hydrangas, syringas, spireas, weigelias, honeysuckles, flowering almonds, lilacs, snowdrops, snowberries and high-bush cranberries—are all hardy in this climate and all more or less ornamental.

Their qualities are generally known, but when sub-divided as they all can be, there is more to be learned about them. I am unable to do justice to the subject, but will say there are snowballs and snowballs, spireas and spireas, lilacs and lilacs, and so on through the whole list.

I have never seen a better snowball than the tall old-fashioned ones, and so with lilacs and other old friends. The new is often introduced as superior when in fact it is inferior in many ways, and may be, like many of the new fruits, not adapted to our climate.

It is not my purpose to discourage new introductions but to guard against humbugs. Don't plant heavily of anything that has not been tested in your locality. The comparatively new national holiday, Memor-

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ial Day, has brought the Snowball, the Spirea Van Houti, the Honeysuckle and any other shrub or flower that blooms about May 30th, to the front and made them more popular.

The Spirea Van Houti is a desirable shrub for cemetery lots with its attractive foliage and its clean habits, together with its habits of weeping, and blooming at the time it does, makes it desirable.

Currants and gooseberries come under the head of hardy shrubs, but are too common to require comment, except the same old caution—"Don't throw away our old friends to make room for strangers."

THE ARTIFICIAL TIMBER SUPPLY OF THE FUTURE.

CHARLES E. HEARST, CEDAR FALLS.

In discussing this subject, "The Artificial Timber Supply of the Future," I do not come before you as an expert on forestry, for such I am not, but I do make a plea for the conditions that already face us, and will materially affect us in the near future, that of the scarcity of our timber supply.

In going about the country one is impressed with the fact that all is being taken and nothing returned. Land is valuable. The timber line as it once existed, is being crowded back to the stream's very bank, and the land used for agricultural purposes; only in the rougher spots remains what was once a goodly forest, and even that is suffering severely from the process of thinning and grass coming in, after which, of course, stock is pastured among it, and death to all new growth which may gain a foothold.

Our timber has stood us in hand to a satisfactory extent for fuel, posts and rough lumber, but is now, for the last few years, failing us.

The artificial groves about the farms here were mostly planted in the sixties and seventies; as the country settled up farther west the groves appeared. They were a necessity in those days for protection alone. They are a necessity today for the same reason, and more so, for our post and rough lumber which we found here have been utilized, and today most any kind of a post costs 15 or 20 cents apiece.

I am not here advocating planting timber for commercial purposes; there are cases I will cite you where that is being done with a great deal of success. But I do advocate restoring our protection first, then for post and fuel, and to some extent our rough lumber supply.

The process of investing by planting has long ago ceased, and profit taking is at its height; now, we must again invest or there will soon be no profits to take.

The present generation must be educated in tree culture, for so little is being done that very few know how or what or where to properly plant. I would say there are three things essential in successful tree culture:

1. Selection of varieties suited to your soil, conditions, and the purposes for which planted.

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2. The placing of the tree in its place.

3. The care and cultivation after planting.

The varieties to plant are important, and the place to plant is also important. On the ordinary farm where groves are not planted for commercial purposes, or on some spot not suited to farming, I think they should be first planted with the object of protection to buildings and stock, and at the same time, our groves for post and fuel answer the double purpose.

In this grove the permanent trees should be set where the grove is desired, and the soft quick-growing trees, interspersed where in years to come they may be cut out for farm use as the others attain a size sufficient for wind breaks.

Of the varieties in this locality nothing seems to be more satisfactory than the soft maple, it makes a quick growth and is a very good kind of tree for a soft tree. Then, the willow makes perhaps the quickest wind break we have; the ash; elm, black walnut, hackberry, all do well, but come on a little more slowly.

For our hardier varieties, such as the oaks and others, a good deal of time is required for their growth.

The hardy evergreens make a most satisfactory wind break, as well as give a pleasing appearance, but come rather slowly.

As regards the post question, by the use of creosote treatment these softer woods can be made into a very good farm post, but I think a much more satisfactory variety would be the hardy catalpa, and the Russian mulberry. These trees grow into post size in 7 or 8 years, and especially the catalpa, make a post and fuel supply when once under way, probably unequaled by anything we can grow.

If we could eliminate the borer, the black locust would be the tree to grow.

While the use of cement must not be overlooked, it cannot answer all purposes. The cement post is all right in its place, but for temporary fencing and building, lumber of some kind will always be required.

The cottonwood must not be overlooked, for if one has low ground liable to overflow occasionally, the cottonwood will make a very profitable crop to plant, if one can wait about 25 years for the harvest.

For commercial purposes, I may cite you to cases in Kansas, to the Yaggy plantation of which you most all have heard, which is a very marked success with the catalpa.

In Nebraska a 16-year-old catalpa grove gave a net return of $152.17 when cut, and others of the same or larger returns. What has and is being done there may be done here, but we are in a different locality and the facts to my mind do not warrant us in utilizing $150.00 land for the present for artificial timber for commercial purposes.

A word in passing for the Russian Mulberry. It makes a quick windbreak, and if planted close enough will grow straight enough to make a very satisfactory post in 8 or 10 years, at the same time affording protection for our berry patches by supplying birds with food.

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In conclusion, let me urge upon you the necessity for planting more trees. The right kind of trees, planting them right, in ground properly prepared, and cultivating them for at least three or four years.

There was on the Teachers College grounds at the southwest of this place a tract of ground planted to trees, a few years ago—principally the quick-growing varieties, which has been cared for in a first-class manner, —and I have never seen such a remarkable growth and so small a loss in any grove planted in this locality.

A good grove surrounding our farm building of the proper varieties, furnishes us protection, fuel, post and lumber, enhances vastly the comfort and appearance of the place, and adds a material asset when cashing out time comes.

THE CRIMSON BEAUTY RASPBERRY.

W. E. DICKENSON. OSAGE.

My acquaintance with the Crimson Beauty dates back a score of years, a time sufficient for one to form a very good idea of its merits or its demerits. It is told of a certain old darkey whose better half in avordupois found it neccessary to occasionally chastise him said, "I've known her pretty well for twenty years and some of the time bettah."

One who has a knowledge only, of some of the red varieties cannot form from them a good idea of the Crimson Beauty. It is really in a class by itself. It differs from the reds in many ways. As its name indicates the fruit when fully ripe is more of a crimson, than red in color. It will stand up fairly well in the boxes, which most reds will not. In flavor it is not as sweet as the ordinary red but of quite marked acidity, which makes it a desirable canning fruit. It propagates like other reds by suckers but nowise as profusely.

When I began growing it I tried to see how much it could be improved by selection and proper methods of cultivation I found very gratifying results. For the first ten years of its culture it was grown on sandy soil, some of it river bottom land. The past ten years further north in Iowa on a clay loam, the results in both places have been substantially the same. We have some of them growing under irrigation in the Yakima valley, Washington, and they are reported doing well.

We have marketed two thousand five hundred quarts from a half acre for three successive seasons. One year when conditions were favorable have increased that to three thousand quarts. Have picked individual specimens which measured four inches in circumference. It has a long fruiting season generally about six weeks. One year we marketed fruit for seven weeks and picked a few berries for a longer time. This I think is as near an approach to everbearing as I have ever made with it. I never had a crop failure with it until this season. It made a brave rally after the first frost, but the two following as they did, ruined the crop for 1910. I have seen a letter from Prof. Beach asking with regard to the

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Alton Red Raspberry which Mr. Gilbertson of Mason City is now advertising. I sold Mr. Gilbertson Crimson Beauty plants five years ago, which he has propagated and fruited since then. They now seem to have blossomed out as the Alton Improved Red Raspberry. Why the necessity of this re-christening I do not know. I always thought the Crimson Beauty appropriately named and have seen nothing to change my views with regard to it. I have just visited the grounds of your Secretary and seen the promising looking strawberries growing there, if they do as well next year in proportion, as they have done this season I shall expect a telephone message next September to go up and sample them.

REPORT ON PREMIUMS.

Best collection of apples grown by exhibitor, C. H. True, $6.00, first prize.

Best collection of apples recommended for northern district, C. H. True, $2.00, first prize.

Best plate of the following varieties:

McMahon, Antonovka, Ben Davis, Fameuse, Wealthy, Annette, N. W. Greening; Malinda, Paradise Winter, Kaump, Walbridge, Iowa Blush, Tallman Sweet, Fall Orange, E. G. Russett, Charlamof. On these 16 plates, $16.00, to C. H. True.

Best peck of potatoes to John Harter, first prize, $1.00.

D. M. Mitchell, *Judge.*

SECRETARY'S REPORT.

Disbursements.

October 25, 1910, railroad fare Cedar Falls and return to Osage	$ 2.38
Letter heads at Wolverton's job office	6.05
October 25, work at Cedar Falls	2.00
October 31st, postage to date	2.50
November, one copy Record Cedar Falls, Iowa	1.00
November 8th 2,000 programs	8.00
Express on programs to Cedar Falls	.25
Postage to date	2.00
November 15, railroad fare Osage to Cedar Falls and return	2.38
Bus fares	1.00
	$27.56
Salary	15.00
Total	$42.56

Money received.

Membership fees	$25.00
Balance due Secretary	$17.56

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TREASURER'S REPORT.

E. BLAKEMAN, DECORAH.

Receipts.

On hand last report	$ 65.20	
Received from Treasurer	150.00	
	$ 215.20	

Disbursements.

November 17, E. Blakeman, railroad fare		$ 2.38
November 17, C. H. True, on order		10.00
November 17, W. A. Burnap, railroad fare		2.48
November 17, G. D. Black, railroad fare		5.92
November 17, W. H. Guilford, railroad fare		5.50
November 17, Mrs. Henry Bluhn, premiums		3.00
November 17, John Harter, premiums		2.00
November 17, Gilbert Hotel, bills		16.50
November 17, C. G. Patten, rent of church		14.00
November 17, C. H. True, premiums		38.52
November 17, Laurens Greene, expenses		7.53
		$107.83
Balance on hand of		107.37
Total		$ 215.20

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REPORT OF COMMITTEE ON SECRETARY'S AND TREASURER'S REPORT.

We, your committee on the reports of the Secretary and Treasurer, have examined them and found them correct.

E. M. REEVES,
G. D. BLACK,
Committee.

REPORT OF COMMITTEE ON RESOLUTIONS.

Resolved, That the thanks of this society be extended to the citizens of Cedar Falls for their cordial and substantial welcome, and personal and collective effort, in contributing to the success of our meeting.

Be it Resolved, That we thankfully appreciate the liberal kindness of the local press, and especially the Daily Record, J. W. Jarnagin, Editor, for the valuable space devoted to the interests of this society.

And be it Further Resolved, That this society heartily thank our president, C. H. True, and our industrious and efficient secretary, C. F. Gardner, for their excellent service rendered in organizing this meeting, and heartily thank the delegate and other members from Minnesota for the valued services rendered.

ELMER REEVES,
G. D. BLACK,
A. LEFEVRE,
Committee.

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PROCEEDINGS

OF THE

NINETEENTH ANNUAL MEETING

OF THE

NORTHWESTERN IOWA HORTICULTURAL SOCIETY

HELD AT

Sioux City, Iowa, November 29, 1910

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OFFICERS OF THE SOCIETY.

P. F. KINNE, President ..... Storm Lake
G. B. HEALY, Vice-President ..... Sioux City
A. S. CAULKINS, Treasurer ..... Storm Lake
W. B. CHAPMAN, Secretary ..... Correctionville

BOARD OF DIRECTORS.

First District—H. N. Antisdel ..... Milford
Second District—L. A. Clemons ..... Storm Lake
Third District—H. L. Felter ..... Washta
Fourth District—A. W. Hatfield ..... Correctionville
Fifth District—E. P. Farr ..... Sioux City

LIST OF MEMBERS.

LIFE MEMBERS.

Antisdel, H. N. ..... Milford
Clemons, L. A. ..... Storm Lake
Chapman, W. B. ..... Correctionville
Connor, H. Murray ..... Castana
Dawson, W. P. ..... Aurelia
Dorward, R. S. ..... Castana
Greene, Wesley ..... Davenport
Hatfield, A. W. ..... Correctionville
Healy, G. B. ..... Sioux City
Hill, Donald ..... Storm Lake
Kinne, P. F. ..... Storm Lake
Lewis, Arlington ..... Castana
Lower, W. B. ..... Sioux City
Unger, D. W. ..... Storm Lake
Waples, W. H. Jr. ..... Castana

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ANNUAL MEMBERS.

Balcolm, H. ..... Sioux City
Brown, J. M. ..... Sioux City
Caulkins, A. S. ..... Storm Lake
Cummings, G. H. ..... Sioux City
Dennis, Dr. A. B. ..... Cedar Rapids
Doty, R. M. ..... Sioux City
Felter, H. L. ..... Washta
French, Henry ..... Sioux City
Kloster, Ben ..... Sioux City
Kruger, S. J. ..... Sioux City
Kneedler, Charles ..... Sioux City
Lancaster, Charles L. ..... Jefferson, S. D.
Langham, Wm. ..... Cedar Rapids
Metz, Henry ..... Sioux City
Rederick, Dr. A. J. ..... Sioux City
Weaver, Claribel M. ..... Cedar Rapids
Whiting, George R. ..... Yankton, S. D.

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PROCEEDINGS

OF THE

NINETEENTH ANNUAL MEETING

OF THE

NORTHWESTERN IOWA HORTICULTURAL SOCIETY

HELD AT

Sioux City, Iowa, November 29, 1910

The society came to order with President P. F. Kinne in the chair. The reports of the directors concerning the fruit crops in their respective districts were called for.

REPORTS OF DIRECTORS.

The reports of the directors were very uniform, the same conditions prevailing over the whole of the society's territory. The abnormally high temperature of March pushed forward unseasonably all plant life and when severe and continued freezing weather came in April, nearly all the fruits were killed. This was followed up on May 3d and 4th by a cleaning up freeze, so that there was practically no tree fruit of any kind in any part of the district, and very little of the small fruits. Where strawberries were kept covered until late there was a fair crop. But generally speaking the year 1910 may be put down as a failure so far as the fruit crops are concerned. Growers are in no manner disheartened, the fruit industry has become too well established for that. The outlook for another season is good, the only unfavorable factor being the extreme dryness of the soil in which the trees and plants have gone into winter quarters, this year having the lightest precipitation since records have been kept in Sioux City.

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MR. HATFIELD: The fact that our orchard trees and fruit plants have been almost barren and have made no return for the past season should not tend to discourage any of us from putting forth our best efforts for the coming season. Such a complete failure in fruit of all kinds has never occurred in our experience. I firmly believe there are few sections of the country where fruit of many kinds can be grown at a greater profit than right here. We have the best of markets, and we have now worked out for us, by such men as Gideon and Patten, varieties that with proper care and attention to the needs of the climate can be depended upon to furnish the fruit. I feel confident that those that move to California to engage in fruit growing, are making a mistake. They will have just as much trouble in growing marketable fruit and they will have to send it a thousand miles or more to find a market.

MR. ANTISDEL: One advantage the California grower has, and it is a big one, he cannot grow anything else but fruit, and consequently goes at it in a business way. But here to the average farmer fruit growing is by no means of first importance, and about as far as he usually gets is to set out a little orchard and does that only because of the wily agent with his oily tongue and alluring pictures. Of course he expects to care for the trees, but the cornfield comes first and the orchard usually not at all.

MR. LANCASTER: Mr. Antisdel's remarks brings up the thought, is it worth while to try to induce the average farmer to grow fruit? There are several difficulties in the way. He can grow other things easier, and like all things else he is prone to follow the lines of least resistance? He doesn't look upon fruit as a source of income, but he does his corn crop, and when the interests of the two clash, as they always do, he sees to the corn crops every time, and attends to the need of the orchard if he gets the time, which he seldom does. Then again this is a specialized age, sucessful men no longer try to do everything, but do one thing and do that well. That is precisely what the western fruit growers does and is the great secret of his success. Why shouldn't we profit by his example? If a man is going to make a success of fruit growing, or anything else, he must devote all his energies to it. As one successful grower once said to me, "I wouldn't give much for the horticulturist who isn't all horticulturist. Another difficulty is the way of making horticulture popular here is the large number of farm tenants, whose members are constantly increasing. Now the tenant is an agricultural tramp,

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there yesterday, here today and in the next county tomorrow. How can you interest him in fruit growing when he is not certain of his tenure long enough to grow a strawberry bed."

As to the average landlord his sole purpose is to get every cent out of the farm he can, regardless of the effect upon the land, the tenant or the country. Under these conditions I don't see how we can interest the average farmer in fruit growing, we haven't so far, and "there's a reason." But I do believe the impossibilities of commercial fruit growing in all parts of our territory are unsurpassed anywhere, and any intelligent young man who engages in it determinedly and wholeheartedly is certain to attain success.

MR. LEWIS: Right here is a good place to say that a 15 acre farm down in Monona county recently sold for $233.33 per acre, the top mark for Monona county farm land. And it was sold to a Michigan man who intends to make it into a fruit farm.

MR. FELTER: A friend who was a recent visitor to the apple producing section of New York, says that important changes in the industry are pending. Apple growing has been a side issue, carried on without proper regard to the necessary battle against disease and insect pests. But now is coming the trained horticulturist, who is buying up the old orchards and applying to them the best modern methods, and this is true of other Eastern States. Within a few years the orchards of New York and New England give promise of returning profit, at but a fraction of the cost of the far western fruit farms. Here there is a suggestion for us of the Northwest. It is more a matter of "how" than of the place and the tree. The successful fruit grower, is the man who makes his work not a side issue to be taken hold of or neglected as fancy or necessity may dictate, but the all important work of the season.

THE PRESIDENT: We will now have the report of our treasurer, Mr. Caulkins.

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TREASURER'S REPORT.

A. S. CAULKINS, STORM LAKE.

1909.

January 1st, balance on hand	$ 243.77
State appropriation	150.00
Membership fees	68.00
	$ 461.77

EXPENSES.

Prof. A. T. Erwin, expenses	$ 8.80
H. S. Swift, printing	7.50
Jas. Baynum, premium	1.00
A. W. Hatfield, premium	11.50
W. T. Worth, premium	10.00
H. Balcom, premium	2.00
Elevator boy	2.00
W. B. Chapman, salary and expenses	80.95
A. R. Toothaker, premium	3.00
P. T. Kinne, salary and expenses	25.30
J. C. Reninson, premium	5.00
Janitor	10.00
Prof. McBride, lecture	30.00
Chicago house	7.90
Electrician for lecture	3.00
Stereoptican for lecture	3.00
H. L. Felter, premium	7.00
E. D. Cowles, display of apples from Vermillion, South Dakota	3.00
	$ 220.95
Balance on hand	240.82
	$ 461.77

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THE PRESIDENT: I appoint as committee on Treasurer's Report, Messrs. Hatfield, Felter and Balcom. We will now proceed to the election of officers for the coming year.

MR. CUMMINGS: If there are no objections, I move that the Secretary be instructed to cast the vote of the society for the present officials to succeed themselves.

The motion was carried unanimously and the Secretary declared the vote so cast.

MR. HATFIELD: As chairman of the committee on treasurer's statement of the society's finances for the year, reported that the committee had examined the said statement and the vouchers in the hands of the treasurer, and counted the money now in his possession, and found the same to be correct.

AFTERNOON SESSION.

MR. PRESIDENT: We will begin our session by a paper on grapes, by Mr. Felter.

WINTER PROTECTION OF GRAPE VINES.

H. L. FELTER, WASHTA.

But few grape growers make it a practice of covering their vines for winter protection, but it is probable that a temperature of 25° below zero will materially injure the last season's growth of wood, and 30° below will often kill two years growth on concords or elm and weaken the vines to some extent.

It is an easy job to trim and lay down the young vines and cover with earth along in November, after the leaves have fallen. But with other vines it is not so easily done, especially if they are of upright growth, but if they had never been trained in a standing position they are more easily bent down to the ground.

Thoroughly shorten the new growth and bend to the ground while another person spades some earth on the top part of the vine, and if the main stem is left out it seems to make but little difference. Some growers think if the vines are only bent to the ground and a few tomato or potato vines thrown over them and weighted down with some pieces of wood or sod that this gives them all the protection needed for such varieties of the hardiness of Concord.

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Is this too much work? Well, you would not loose your grape vines during a hard winter that comes one year in four, and you could raise even tender varieties in northern Iowa, and the hardier kinds anywhere that Dent corn will grow.

MR. HEALY: There can be no question about the soundness of Mr. Felter's position. We are too careless with our grapes, and all other kinds of fruit for that matter; we shall never make the success of fruit growing that is possible for us to do, until we make it our primary business instead of a recreation, or a side line. Grape vines should be laid down and covered. If the ground is frozen coarse manure or litter of some kind will be effective, but soil is better. The Concord, Moore's Early, Brighton and Diamond are among the best varieties and are well worth having in a family fruit garden, when the best things that are hardy here are grown. In trimming all kinds of vines, it should be kept in mind that th fruit of next season is borne on the wood that grew the present season and that 75 buds are sufficient to make a crop on a vine of ordinary varieties. I believe the possibilities are not to be excelled anywhere. The soil and topography along the bluffs of the Missouri are unsurpassed for the grape, and this truth I believe will sometime be recognized in a practical way.

MR. CLEMMONS: Grapes are easily propagated from layering and the new vines will be true to name. Well rooted young plants will begin to bear the third year after setting in a permanent row; and with good cultivation and general good care, such as outlined by Mr. Felter, will bear good fruit every year and increase in productiveness with age.

THE PRESIDENT: We will next have a paper on flowers by Miss Weaver.

CHARACTERISTICS OF THE FLOWERS.

MISS CLARIBEL M. WEAVER, CEDAR RAPIDS.

The subject for our consideration this afternoon is the characteristics of the flowers, and if I talk you to death upon this, to me, most interesting theme—the consequences must be upon the heads of your program committee, who discovered my fondness for this particular branch of nature study and have placed me in position to inflict all my foolish fancies and observations upon you; and by the use of the broad word "characteristic" they have indeed given me a wide scope; for as you no doubt all

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very well know, it has a dozen synonyms which are attribute, character, distinction, indication mark, peculiarity, property, quality, trace and trait. And flowers, according to the "Standard", are not only blossoms themselves, but also plants which bloom, so, if I drag you far a field, exhausting all your patience, I shall shelter myself from your displeasure behind this network of words, and find an excuse for all my wanders in the latitude of my subject.

It seems to me that the first thing which comes to mind, in connection with the word "flower" is the thought of beauty. Every flower is beautiful, I make no exceptions. If you do not believe it, examine the one you wish to exclude, under the power of a microscope and see if you do not become a convert to its charms.

But it is not as a botanist, who examines minutely with forceps and glass in hand, the various parts of every flower, that I lead you to an interested regard for them; because in general I do not myself like to pluck the blossoms into pieces, and I gain little satisfaction from counting the sepals, petals, stamens, or carpels. My delight is to look for family relationship in the diverse varieties by noting their outward resemblances; the graceful curves displayed by the lily family, from the time wild adder tongue to the stately queen of the garden, the rounded and regular beauty of the rose from the common briar to the hot house darling; and to marvel at the wonders and surprises of the orchid family.

NATIVE IOWA FLOWERS.

But the subject about which I wish to speak particularly is our Iowa flowers—to note their order of coming, their favorite locations, their scales of color, and their fragrance and beauty which have the power to speak to the souls of those who love them, messages of deepest interest and highest import, for flowers have been the worthy study of the great in intellect, and the reverent of soul. Botanists have spent their lives in making their acquaintance, and they have been the inspiration of poet's pens. Tennyson says of one of the least of them:

"Little flower in the crannied wall,
I pluck you out of the crannies,
But if I could understand what you are
Root and all, and all in all,
I should know what God and man is."

If we have not come to quite so great an appreciation as what the true knowledge of the flowers might give us, yet we are, all of us, I think, susceptible to their beauty and refining influence.

When spring comes the grayish branches of the trees will grow red because the sap is rising. The Wake Robins and hepatecas will form a thousand infintesimal buds which with a few weeks thawing will bring forth flowers.

Do you say that the expression is far fetched—the flowers are blind and senseless? The son of Charles Darwin declares that flowers have eyes and can see—I do not know, but I know that never a morning-

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glory, bean or pea vine failed to find the nearest way to a supporting pole; that every plant turns toward the sun, and that every crocus and pimpernel close their petals for a passing cloud. Not eyes like ours, but who shall say what constitutes blindness. The Roentgen ray has opened our eyes and mind to many possibilities.

ANIMAL AND VEGETABLE LIFE.

The great distinction between animal and vegetable life lies in the power of the plant, to use for its growth and nourishment what we call the inorganic substances of the earth. Out of its soil water and gases, the speck of life in the forest tree has power to develop a hundred thousand times its weight in foliage, wood and fruit. From these inorganic substances only no higher form of animal life can be sustained.

We, together with the horse, cow, sheep, etc., are dependent on the plants for life and nourishment.

If you say we might live on animal food, yet the animal must first be nourished by the consumption of vegetable products. This power to produce from these inorganic substances all the varied, wondrous and beautiful forms of fragrant, growing, blossoming life seems to me the first and greatest characteristics of the plant creation.

The development of the plant from the tiny seed is one of the most interesting processes of plant nature. We may take two seeds, alike in every respect of form, size, color and construction so far as the eye can discern, and plant them side by side in the same spot of earth. There will come up two tiny leaves from each seed, the four almost identical in appearance. We watch their growth day by day; the expanding leaf, the lengthening vine; at last the little yellow flowers appear and soon on one a tiny oblong prickly fruit follows which grows daily larger and larger for a week or more, when it is ready for the salad dish. On the other comes a tiny green fruit, not so long in proportion—to girth, and not prickly, but a soft and downy oval—changing to a ribbed and flattened sphere, becoming yellow, juicy, lucious, fit for a princess' breakfast. The mysterious speck of life, hidden life, in each seed has developed acording to its nature, the two dissimilar forms of cucumber and melon. So rose and lily, moss and oak, are alike formed from the few elementary substances of oxygen, hydrogen, carbon, nitrogen, earths and mineral salts, with decaying matter, mixed in varying proportions as—the life principle in each plant adapts these substances to its need, and so produces all the varied and wonderful forms of vegetable life. It has been likened to the different combinations of the "nine digits and naught" which the mind can imagine "or the simple letters of the alphabet which may form every variety of composition." As the warm rays of spring sunshine begin to flitter through the leafeless trees of the forest, the little wood blossoms are the very first to answer to his call.

The hill tops are bald and the meadows are bare of blossoms, long after the wake robins and hepaticas have filled the forest with their fragrant breath. I know of but one truly early meadow flower, and that is the marsh marigold. All our other very early ones appear in the

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woods or among the hazel and sumac bushes; and these first comers are the most delicate in color, ephemeral, and fragrant, of the procession which beautifies the earth.

THE DAINTY FIRST FLOWERS.

Who ever found a scarlet flower under leafless trees? The prevailing colors are but pale tints, or pink, blue and lilac; white the blossoms of the Dwarf trillium, the blood-root, the dicentra, the adder tongue and a great proportion of the hepaticas and anemones are white as snow which so lately covered them. As the season advances the colors deepen. In the woods comes the blue-bells, the violets, yellow and blue; deep pink crabapple blossoms, lavender, wood phlox and columbines; but when the sun of mid-summer is high in the heaven, and the trees are in full leaf, then only appears the fiery torch of the cardinal flower or scarlet lobelia or the gorgeous butter-fly-weed—on sandy clearings and along wood sides may indeed a little earlier be found the Castilleia coccinea, or painted cup, which by the way has been variously insulted by opprobious names of British soldier, Indian pink and bloody soldier.

THE PAINTED CUP.

This plant is said to present the most dazzling bit of color in the scale of vegetation; but its true flower, like that of its Mexican cousin, the Poinsettia, which has become a hot house favorite is a very small and unobtrusive speck of dull yellow, which is quite eclipsed by its surrounding brilliant foliage.

When the last of March, the month of April and the greater part of May have given a wealth of blossoms in the woods; the season then takes up her gardening in the meadows.

Among the cool moist grasses, comes another varied host, the darlings of the prairie. These flowers more brilliant than the early ones, grow on large stems. They try to peep over tall grasses.

Here you find the deep blue violet, the strong scarlet peppermint plant, the white and crimson phlox, the wild geranium, the tall American cowslip, yellow buttercups and orange puccoons, tassle flowers, wild candytuft and everlastings. After these comes the brilliant meadow lillies, the tall meadow red, the smaller lilies, growing in clusters on long curving stems and modestly looking on the ground, the blazing stars, the blue spiderwort.

Then still later black eyed Susan, pretty pink milkwort, closed Gentains, purple ironweeds, blue vervains, the great Lobelias and others.

As these flowers fade the roadside becomes a scene of great interest. Here are assembled tall and queenly flowers robed in royal purple, the trumpet weed and iron weed; showy high headed asters, large eyed laven asters, blue asters with crimson centers, feathery white asters and numerous intermediate shades.

There are stately yellow flowers, artichokes and sunflowers, rudbeckias and bur marigolds, while ten varieties of goldenrod gleam as with all the gold of Solomon's mines.

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Then there is the ragged looking spike of Mullen, a plant which formerly it is said comes from England, but is now cultivated there as a rarity and called the beautiful American velvet plant. The dull lavendar flowers of the wild bergamont would attract little attention among so many showier sisters, but the plant compels regard by its strong and aromatic odor.

Doubtless the sweetest scented of stately roadside "sentinels" is the common prickly thistle, a pugnacious soldier, armed for defense at all points, save in the center of his brush like flower, where bumble bees buzz happily, and where if you are courageous, may venture to bury your nose for one long breath of sweetness. But we look at all these later flowers with feelings of regret, for we know that for months there will be no more to follow them.

And yet we feel that their decay is but the preparation for another spring; that for every faded posy there are a hundred tiny seeds scattered far and wide, each with its hidden speck of life, ready to send forth at the appointed time its plant according to its nature, to grow, and thrive, and blossom again when a new year comes.

FLOWER COLORS.

There is one thing in regard to the color of flowers which seems particularly strange and mysterious. Did you ever notice that all the varieties with their wonderful range of color there is not one which displays in the same variety the three shades of yellow, blue and scarlet, or any brilliant shades of red. Here is a wonderful array of colors: pink, cream, yellow, crimson, red, magenta, white; but never a blue rose. Suppose we search among the verbenas: Here we find the blue, the pink, the white, the purple, the brilliant glowing scarlet, but no yellow. The pansy shows all the blue and purple shades, the dull wine, bronze, black, white and yellow, but no scarlet. Take the poppies: Here again is yellow, scarlet, pink, maroon, etc., but no blue, and so we find it through the whole list, so far as I have been able to discover. Scarlet, blue and yellow seem to be unable to dwell together in the same family. Why this limitation should be set upon the flowers we have no way of knowing, and the mystery of it is a pleasant speculation. So I hope the wizard Burbank may never be able to produce a blue rose. I have already seen too many of them upon the milliners' bonnets.

CAN PLANTS FEEL?

If we believe with Darwin, that flowers have eyes and can see, we must much more certainly believe, that they have nerves and can feel. I have a dear and tender hearted friend who said to me one day: I never burn my withered blossoms, because I fancy they may still have feeling. Did you ever see a thrifty and beautiful sensitive plant, with all its fern like leaves and branches expanded, drop suddenly to a withered lifeless and ragged looking bunch of pendent twigs; and all because of a slight touch of the finger against but one of its delicate leaves? The sensation was carried as by an electric current from that one leaf to the stem and from

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the stem to every branch and leaf and all alike responded to the message by immediate action. It is said that if a lighted match be held an inch or two from the end of one of the long leaves of the Mimosa, all the little leaflets in order, beginning with the one next the heat, will slowly fold, then the main leaf stalk drops and the whole plant, every leaf and stem becoming limp and looking as though dead. There is one variety of sensitive plants which it is said is affected by contact with the human hand only. It seems insensible to the touch of a stick, insect, bird or beast, but withers at a stroke of the finger. So among our little friends along the way, in shady nooks, or open prairies, we find those who seem to smile and nod to us; those who only look at us; the clinging vines and thorny briers who fairly reach out to us; and the timid and sensitive ones who shrink from us, and we love them the more for these human traits that we find in them. Almost unconsciously we compare them to friends, and find in each some lovable characteristic which is accorded with the thought of our dear ones.

We say of our beautiful friend, she is like the rose, of the witty and brilliant, she is like the flame-flower; of the gentle and modest, like the violet and pansy. The Clematis is the emblem of mental beauty, and the water lily of the pure in heart—that most lovely of flowers, because out of the very worst of elements; the muck, lees, ooze and slime of its surroundings it produces the fairest of blossoms—pure of heart—to convert the very filth to beauty. When Longfellow wished to describe the transcendent beauty of the city of Venice, he compared it to this flower.

"White water lily, cradled and caressed
By ocean streams, and from the silt and weeds
Lighting the golden filaments and seeds,
Thy sun illumined towers, thy crown and crest."

As I walked abroad in the light of a new spring I feel that our study of these interesting, beautiful and varied specimens of plant life will add a new charm to every ramble and scene; and I trust that we shall go forward eagerly, like children seeking elves in every nodding flower-bell and fairies under every fern, and like the poet Percival, shall find:

"The world is full of poetry; the air
  Is living with its spirit and the waves
Dance to the music of the melodies
  And sparkle in the brightness, earth is veiled.

And mantled with its beauty, and the walls
  That close the universe with crystal in
Are eloquent with voices and proclaim
  The unseen glories of immensity.

In harmonies too perfect and too high
  For aught but beings of celestial mould,
And speak to man in one eternal hymn
  Unfaded beauty and unyielding power."

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THE PRESIDENT: The writer of the interesting and instructive paper to which we have just listened, speaks as one to the "manor born" in a horticultural sense, as she is the daughter of the originator of the Weaver plum, so well and so favorably known to us all. Mr. Lancaster will now give us his experience as a fruit grower in South Dakota.

THE EXPERIENCE OF A FRUIT GROWER IN SOUTH DAKOTA.

CHAS. L. LANCASTER, JEFFERSON, SOUTH DAKOTA.

My experience in growing fruit in the extreme southeastern part of South Dakota, located in Big Sioux Valey between the Missouri and Big Sioux rivers.

The valley is from two to seven miles wide and thirty miles long, the valley running northwest and southeast. I am located about four miles from the southeast end of the valley. The soil is a black loam, with a clay sub-soil, the black soil is from five to ten feet deep. I have an orchard of about 1,000 trees, mostly apple and plum. I have apple trees from two years old up to fifty. The oldest trees are from seed my father planted, and have attained the size of sixteen inches at the butt and are about forty feet tall, and seldom fail to have a good crop of apples. 1910 was the first year in twenty-five that was a complete failure. I have Ben Davis trees thirty-five years old, and must say that I have tasted Ben Davis from Colorado, Oregon and Missouri, and the Ben Davis apple grown in southeast South Dakota is far better in texture and flavor than any I have ever tasted from other apple sections. I have some green apples, with a pink blush, that for quality are equal to Jonathan or Grimes Golden. I have Scott's Winter apple that do well. They are smaller than Ben Davis, but are fine flavored and good keepers. I have six Wolf River trees seventeen years old wtih a spread of branches forty feet. They bear scattering apples nearly as large as pumpkins and not much better for dessert, although they are pretty good cooking apples. The Northwestern Greening is a good apple with me, both tree and fruit. The tree seems very hardy and apples keep in good shape all winter. I have several apples I am testing. Among them are Liveland Raspberry, Charlemof, Summer Champion, Black Ben, Delicious and King David, and several others. And I hope the late freezes in the spring will stay away and allow me to have some apples at the Northwestern Iowa Horticultural meeting in 1911.

Now about plums, they do fine in southeastern South Dakota. In the early settlement of this country the plum was growing along the banks of the Big Sioux river in great profusion and of very good quality, but of late years the plum thickets have been pastured and the tent caterpillars have wrought destruction with the native plum, except where the farmer planted it in the home orchard where they are doing fine. I have in my

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orchard red plums, yellow plums, pink plums and plums of all colors of the rainbow. They are mostly from pits that my father planted. The best and largest plum I have is from a sprout I pulled up in one of my hunting trips. It was late in October and the leaves were all off the trees. the parent tree was in the shade of a hill on the south and some plums remained on the tree. They were the largest plums I have ever seen; they were the size of the blue plums from California. This plum is one of the best plums for the home orchard and a good plum in a commercial way, will pay well near Sioux City, Iowa. I have several Burbanks hybrids that I expect will bear in 1911. I hope to be able to report on some of them at the next meeting. Japanese and European plums are very little used in southeastern South Dakota. Red June killed to the ground winter of 1909-10, Moore Artic and Tadge nearly all died. Peach trees killed same as Red June down to the ground. I have peach trees seventeen years old and they were killed to the ground in the winter of 1909-10. The early hard freeze in fall of 1909 was the worst that I have ever seen in South Dakota in the fall, and the freeze in the spring of 1910 was the worst spring freeze we ever had.

The cherry does very well on dry ground. I have some cherry trees fifteen or twenty years old, that seldom fail to have good crops every year. They are dark colored and quite sour. I also have some Compass cherry that I expect to bear in 1911. I hope I can report on at next meeting.

Small fruits or bush fruits do well with us. The currant is one of the best for home orchards; the strawberry does fine, and among the best is Senator Dunlap. I have strawberries that were planted among the apple trees about forty years ago, and they still bear fine berries. Gooseberries certainly do grow here. I have some bushes eight feet tall, in fact a hedge of them, which no hog can get through, and no chicken can fly over them. Raspberries and blackberries do pretty well when protected in South Dakota, especially blackberries must be protected to insure a crop. Raspberries do very well without protection. Grapes when they don't die out root and branch do well with us. It seems very hard to get the grape to live in the black ground, but when they do bear they are fine grapes.

The enemies of fruit in South Dakota are few. The coddling moth is the only one that bothers the apple. We have no San Jose scale. The one thing that must be done with the apple tree in South Dakota, is to have a low head so the trunk will not sun scald. I lost several trees when they were ten years old from sun scald. The plum gouger and curculio does not bother to any extent; the tent caterpillar is the worst enemy of the plum, but it is easy to combat the caterpillar, a corn cob soaked in kerosene and fastened to a fish pole and lighted will scorch him good and plenty. The currant worm bothers the currants to some extent, but white hellibore will fix the currant worm.

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MR. METZ: There is one remarkable thing in Mr. Lancaster's experience and that is the age of some of his apple trees. Longevity is a virtue fruit trees in the west are not supposed to possess, but fifty years is a ripe old age for an apple tree anywhere.

MR. KINNE: Mr. Lancaster speaks of the Wolf River as a fair cooker, which is not so far from the truth. We stumbled on a way of cooking it which makes it very pleasant to take. Rim out the core, fill the cylinder hole with sugar, and put in the oven and bake. Try it and you will find it delicious.

MR. HILL: Mr. Lancaster commends the plum both for the house and the commercial orchard. Plums ought to be profitable on his location, as he has the right soil and is near a good market. Plums of the native sorts should be grown much more extensively in this district than they are. Soils too rich in humus are apt to cause too much wood growth on native plum trees at the expense of fruit and to cause them to break from overload of foliage. Because the native varieties are so liable to split it is desirable that the plum orchard should be protected from heavy winds. If you must plant in a windy place surround your plum orchard with a good evergreen, willow or other hedge, that will grow high enough for a hedge. If possible get trees that are on their own roots. If you cannot get these plants the young trees at least six inches deeper than they grew in the nursery, this will permit the tree to throw out new roots above the union and you will soon have trees on their own roots; such trees are much more hardy and the suckers that come from them will be of like variety of the original tree and can be reset to enlarge the plantation. Of varieties I recommend, Desoto, Forest Garden, Wolf (freestone), Wyant, Stoddard and Hawkeye.

MR. CLEMONS: Poultry will be found a great help in keeping down the curculio in the plum orchard; and a few shoats turned in after the plums are gathered will do good work by picking up the fruit on the ground.

MR. HEALY: I notice the paper speaks favorably of the Northwest Greening. I should like an expression of opinions from others upon this apple. For myself I am done with it, and think we should be very cautious in recommending it.

MR. KINNE: It seems to be losing much of its popularity, lacking in the essential of hardiness. At the northwestern meeting it was generally conceded that it is not a reliable tree for northern Iowa,

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and the Salome, which has been so widely advertised as a winter apple for the north, is proving to be of insufficient stamina to withstand the vicissitudes of our climate. But the popularity of the Wealthy is increasing by leaps and bounds, and that, too, all over the northern apple belt from the Atlantic to the Pacific. It has been so much in demand in the nurseries that for the past season its price in quantities has been at a premium over other varieties. As a dessert fruit at its best it will compare favorably with the Jonathan. It is a reliable apple to hold in cold storage and in this way its season may be prolonged several months. It is a good apple to plant and tie to, and the more it is grown the greater will be the demand, for unlike the old Ben Davis its quality will entice the consumer to buy more and come again. I believe there is nothing more profitable that can occupy the soil than a good, well-cared-for orchard of Wealthy apple trees.

THE PRESIDENT: We will next have a paper on growing trees that bear nuts instead of apples, by Dr. Dennis.

NUT CULTURE FOR NORTHWEST IOWA.

DR. A. B. DENNIS, CEDAR RAPIDS.

The wonderful progress of nut culture in the south with the pecan in the east, with the chestnut and Persian walnut, should arouse all Iowa planters to select and plant nut bearing trees and bushes for food, timber, shelter from our cold winters and restful shade in our summers. We can scarcely hope to succeed with the pecan or Persian walnut, especially in northern Iowa. The time really is at hand when even in Iowa, we should cultivate all kinds of edible nuts, in trees and bushes adapted to our severe climate; nature that is never niggardly of her blessings in good fruit and nuts, has not given all her good things to more favorite climates; but wisely in her natural selection, has made ample provision for the human race in all portions of the globe, and in all climates. We sometimes compain and find fault because Iowa has not her share of good things in horticulture. Yet nature gave wonderful crops of wild plums, berries and nuts when she bade the pioneers sixty years ago to take possession of her broad prairies and lovely woodlands along all Iowa streams whose native beauty no pen can describe or brush paint. These woodlands that dotted the prairies like islands in the sea, were planted by her own efforts, and natural selection of fruits and nuts, in plum, apple, hickory, walnut, hazels and berries in quality and flavor, were superior to those grown under cultivation in milder climates, and yet we find fault with nature, and frost, because we cannot grow the products of milder climates in Iowa soil. It

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took nature thousands of generations to select the varieties of wild fruits and nuts best adapted to our rigorous climate, as well as impart quality and beauty to these fruits and nuts; but it has taken men scarcely half a century to destroy this wonderful work that nature so wisely provided for the early Iowa settler, and it becomes us not to find fault with her wisdom of selection, or her climate, but rather to the thoughtless destruction of our natural inheritance nature so lavishly provided our early settlers in lovely Iowa. There are still a few hickory and walnut that escaped destruction by our hands, but no thanks to man for even this blessing of preservation, for most varieties of nut trees, now found are of second growth of timber, young trees that nature has preserved in spite of man, horse or cattle. These delicious nuts are from sprouts whose parents were cut over fifty years ago. Nature seems determined to preserve her early work by these sprouts that soon grew into heavy trees again, and I beg all lovers of trees and nut food to spare no pains or expense to rescue these second growth nut bearing hickory and walnut, and set large acreage of all choice varieties. The black walnut perhaps will be the most profitable for northern Iowa, on account of its valuable timber for lumber. Black walnut, once so plentiful in the United States is almost gone, and the price of walnut lumber has advanced from year to year, until today it commands fabulous prices, from $150.00 to $600.00 per thousand feet for choice quality. It takes from thirty to fifty years to grow walnut for lumber of the wild type of hybrid improved varieties not over twenty to thirty years. It is easily worth from $1,000.00 to $2,000.00 per acre for lumber alone, say nothing about the tops for wood and the delicious nuts for the girls and boys many years before cutting for lumber. The hickory is much slower in growth, but makes a beautiful tree for either park or orchard, with the best nut that grows. Hazel might also be planted in northern Iowa, whose bushes bears early of splendid nuts.

I believe the time is opportune in all parts of Iowa to plant all our native nut bearing trees and bushes, thereby modifying our climate, supplying winter shelter, and beautifying the landscape, giving pure air and food and in later years a fine crop of lumber. If this imperfect paper will induce some young man to engage in this branch of forest planting, I shall feel my time not wholly lost in penning it.

MR. HEALY: This is a valuable paper, much to my liking. It opens up a new and broad field in tree growing. The willow and cottonwood had their place in the pioneer life of the prairie and they filled it well, but with the high price of land now prevailing, no one can longer afford to grow them. But it seems to me no farmer could provide a safer and cheaper insurance for his family, than to set aside say, ten acres of land and devote it to the culture of the improved black walnuts, of which the doctor speaks.

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If any one thinks Iowa cannot grow choice edible nuts, he should attend the meetings of the state society and see the fine display at Des Moines each year.

THE PRESIDENT: We all like to exploit our successes, but it requires courage publicly to tell of our mistakes. But this Mr. Clemons is about to do it in his paper.

MY MISTAKE IN HORTICULTURE.

L. A. CLEMONS, STORM LAKE.

It has been said that open confession is good for the soul. May it not be a good thing in temporal affairs to look back, and review some of the mistakes we have made in our work along some special line and record them in some form, so that others who are about to enter a like occupation, or field of work, may see and avoid in some measure mistakes we have made.

In the spring of 1894, I persuaded myself that a commercial orchard was about the thing for me to engage in. Looking about and getting what information I could from published reports, I concluded that apple trees should be set thick on the open prairie and that 20 x 16 feet apart would be about the right distance. At this writing with twenty acres of apple orchard set in that way from 1894 to 1900, I find I have a lovely brush patch, tops meeting in some places both ways—good air drainage denied, the tops and roots restricted to too narrow a space for feeding ground; and myself grown older, yet with some hope that I have grown wiser along this line; now seeing the necessity for cutting out every other row diagonally across the orchard, if success is to attend the venture. This mistake will call for younger muscles and more endurance than is now left me, and even this will leave most kinds too close together, for what would in my opinion bring best results to both trees and fruit.

At this time if setting a new orchard I would put the trees no less than thirty-three feet apart; setting no plum or other fruit bearing trees in as fillers, or anything between for experimental purposes. There need be no loss of land while the trees are growing; the spaces between rows can and ought to be cultivated for a great many years to a good rotation of hoed or plowed crops. You will get a lower topped tree, more convenient for picking the fruit, for spraying and any of the other necessary orchard operations, more ease and satisfaction getting about among the trees with teams for the work necessary to be done. Another mistake was in not doing more trimming when the trees were small and forming tops to keep them growing in even balance without too many limbs. Now it would be a great job and probably do a great deal of permanent injury to the trees to do what should have been done when young.

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From time to time I have set considerable small fruit. I find the same principle applies here as with orchard trees. I have set blackberries, raspberries and currants 4x4 feet apart. In about three years I can climb on the fence and look over a patch of weeds and briers and wonder what I will ever do with them. In fact I am driven out with little results that could be termed satisfactory. I am now setting rows from twelve to sixteen feet apart, four feet in the row. Here again there need be no waste ground, as the blanks between the rows can be put to garden stuff, or some hoed crop; this gives abundant space for cultivation, getting in with wagon for mulching and taking out the old canes. Don't put such fruit plants in some close corner, but give an open space where you can get about them during their natural life.

MR. HEALY: Mr. Clemons gives expression to what many of us realize to be our own mistakes in orcharding. A few years ago, close setting was the orthodox method, the theory being that trees would protect one another. As one prominent horticulturist was fond of putting it: "The best protection for an apple tree is another apple tree." But as the trees have grown and the wet years have come, we have learned better, and are confronted by the difficulties Mr. Clemons speaks of. It was once thought that an apple tree out in the prairie should not be trimmed, and when this teaching was followed, as it was generally, the results have been as Mr. Clemons describes them. While in an orchard at Sturgeon Bay, Wisconsin, last summer, I saw a simple and effective way of preventing limbs from splitting. A wire staple was driven into the limb, another into the trunk of the tree and a No. 12 wire connected the two. This is much better than propping the limb or fastening it to the trunk with a bolt.

MR. LANCASTER: I use screw eyes in place of staples.

MR. WHITING: A small staple will not split the tree, and it soon rusts so that it cannot be pulled out.

MR. HEALY: This method is especially good for the Northwest Greening, which is so subject to splitting. One can go over an orchard in a short time.

MR. CAULKINS: Don't you put the wire around the tree?

MR. HEALY: O, no, that will never do.

The sap will soon rust the staple so that all the king's horses cannot pull it out.

MR. TOOTBAKER: The experience of Mr. Clemons only adds emphasis to what has already been said of the necessity of making

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fruit growing a business and not a side issue, as is now the usual way. I believe the use of artificial heat to prevent damage by frost a matter which should receive our earnest consideration. I had an interesting conversation on the subject at the Council Bluffs show, with Mr. Mincer, who, as you know is the only man who raised apples in any amount in Iowa this season. In an orchard of twelve acres he had 1,000 heaters of medium size, but in an ordinary season he considers 50 heaters to the acre sufficient. His oil was bought by the carload and cost less than three cents a gallon.

MR. KINNE: What kind of oil at that price?

MR. TOOTBAKER: Crude oil bought in Kansas City. It should be got here cheaper than it can be in Colorado.

Several small growers could combine and get it by the carload, you know co-operation is the word.

MR. BALCOLM: Crude oil is worth only about a cent a gallon in Kansas. In an ordinary freeze I think the thorough use of pots will save the fruit crop. But last spring an extraordinary condition confronted us, a condition which judging by the past is not likely to confront us again in many years. With such long continued low temperature accompanied by such high winds, I don't believe the pots would have been of any practical use. That is, in this vicinity.

A FRUIT EXCHANGE FOR IOWA.

WESLEY GREENE, DAVENPORT.

If Iowa fruit growers are to compete successfully with growers from other sections of the country in selling the products of their orchards, they must put on the market as good fruit as their competitors, or they will not receive the highest price, and when the market is fully supplied, their fruit will be left without a purchaser. The loss of the fruit not only carries with it the expenses of picking and packing it, but the transportation charges also. Such experiences tend to discourage the grower, if he does not lose faith in the industry and abandon it to his rival.

To secure a uniform grade and pack of fruit there must be co-operation among growers who recognize a fixed standard from which grades may be determined. It is true an absolutely perfect standard cannot be obtained for any variety of fruit on account of modifying influences of environment, but there are always enough stable characteristics to give it a standard value.

A Jonathan apple from Oregon, Colorado, Iowa, Ohio and New York may not have exactly the same flavor or weight, though the apples selected are

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of the same size. The apples from Oregon may be larger and brighter in color than those from New York, but of less specific gravity, but these minor differences are not so important in determining grades as are the defects which exclude the culls.

No package of apples should be marked "Fancy" which does not contain perfect specimens free from worm holes, scale, fungus, bruises, or other defects that would mar its market value, and no package should be marked or sold for No. 1, which contains more than ten per cent of imperfect apples.

It is the careless manner of growing and marketing fruits that has retarded the growth of the industry in this state. A fruit exchange would be helpful in bringing about better business methods between the producers and consumers of fruit. An exchange would guarantee to the consumer a uniform grade of fruit in the package, and instruct the grower how to produce the grade desired.

In any section where three or more persons are engaged in growing fruit, they could organize an association and elect a board of directors to manage its affairs. The secretary should be the general manager of the association. Each association should own a packing house where all fruits handled by the association should be graded, sized and packed under the scrutiny of inspectors.

Every fruit association should own or have access to a cold storage plant, a canning and evaporating establishment, a factory to make butters, marmalades and jellies, cider and vinegar presses, an alcohol still, and all the apparatus necessary to preserve perishable fruits of good quality for future use as food, and to convert the culls into denaturized alcohol for motive power.

The utilization of the waste products from a factory often determine the profits of the enterprise. If all the fruits and vegetables were sold which rot every year in the orchards and gardens in Iowa because there are no convenient markets for them, they would yield a revenue large enough to pay the entire amount of money appropriated by the legislature of the state for the biennial period.

The scheme adopted in the organization of the Florida Citrus Exchange is briefly epitomized as follows:

"First—The Grower, who is the producer and sole owner of the business.

"Second—The Association, which is the packing agent of the grower.

"Third—The Sub-Exchange or forwarding agent of the grower.

"Fourth—The Exchange, or distributing, selling and collecting agent of the grower."

It appears to be an ideal arrangement for the sale of fruit on a co-operative plan. The grower owns it and why should it not give him the service he demands? If it fails, it will be from inefficient service of his employees.

The advantages of an organization of this nature is that it gives to the grower the very best service obtainable at the lowest cost. It specializes the work and thereby brings greater efficiency to everyone connected with the Exchange. The grower has two duties to perform: First, to grow the

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very best fruit he is capable of producing from his orchard, and, second, to elect honest capable men as directors of the Association. On the directors rest all the responsibilities of the Association, and will largely determine its success or failure. They elect a manager, and should see that he performs all the duties required of him. Everything is inspected and checked over from the smallest fruit picked to the lowest paid employee of the association, to eliminate culls, whether it be an employee or a fruit. Excellence is the pass word all the way down the line.

The grower who can raise nothing better than a cull is soon eliminated from the association, as are the employees whose services are no better.

It is the duty of the manager to see that the fruit is brought to the packing house in good condition, that it is carefully graded and packed and loaded into cars; to post all bulletins received from the sub-exchange and to keep it advised on the amount of fruit to be shipped from the association. It is also the duty of the board of directors to elect one of their number to serve as a director of the sub-exchange.

The sub-exchange is composed of one director from each association in that district. The directors of the sub-exchange elects a manager who must perform the duties required of him. He must forward all cars loaded by the associations under the order of the exchange and keep a record of the same, and receive all checks for fruit sold by the exchange and forward them, and also bulletins received from the exchange, to the managers of the association, and must keep the exchange advised of the amount of fruit to be shipped from that sub-exchange.

The director of the sub-exchange elects one of its number to serve as a director in the exchange.

It is the duty of the exchange to sell all the fruit received by the sub-exchange, and to collect the money for same, and to remit it to the sub-exchange, together with bulletins showing the price received for the fruit, and the general condition of the market. The Exchange keeps an agent in all the larger markets of the country to which their fruit is shipped, whose duty it is to report the condition of each car load of fruit on arrival, and to find a purchaser for it, if not sold before shipment or arrival. A complete record is kept of every package shipped in the car, and the car by sub-exchange number, so that if anything should go wrong, it can be traced to the party responsible for it. Every member of the association receives, or can see a copy of the bulletins sent out by the exchange, and can trace his car by the sub-exchange number, so that he may know at what price it was sold in a few days after shipment. If the car has been delayed and contents damaged, that fact is noted. The legal department has charge of all claims for damage caused by delays in transit, and is more successful in adjusting them, and at less expense, than those from individual shippers, when the claims are small but numerous. The cost and delay in adjusting claims for loss of fruit in transit, usually deter shippers from attempting to collect these claims from transportation companies.

I believe that if the fruit and vegetable growers of Iowa would organize an exchange for the sale of their products along lines similar to those followed by the citrus growers in Florida and of the Pacific coast, they would find a better market for their fruits and vegetables than they do at present.

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THE POSSIBILITIES OF A TOWN LOT.

WILLIAM LANGHAM, CEDAR RAPIDS.

The possibilities of a town lot, under a guiding hand can be converted into probabilities of the most realistic sort. A lot say 50 x 140 feet, which is a common size, can be made not only a thing of beauty, but one of great usefulness as well. A friend of mine who owned a lot similar in size to the one above mentioned, once asked me to tell him how he should plant it to the best advantage. I gave him my plan as follows. First I set aside 40 x 50 feet in the front. This gives ample space for a house, walks, and a nice fringe of ground for shrubs and flowers if desired. I have now left a plat 50 x 100 feet. Commencing on the side of most sunshine and four feet from the division line I would plant a row of grapes. This row will hold twelve vines, eight feet apart. For varieties I would take two Moore's Early, two Worden, one Pocklington, one Moore's Dimond, two Wyoming Red or Lutie, and four Concord. These vines when of proper size should be trained to a five foot trellis, the lower wire being 30 inches from the ground, the second, 45 inches, and the third, 60 inches. In the Autumn after the leaves have fallen, prune and lay down and cover (just moderately) with dirt. Above latitude 42° it is best thus to protect the vines. To protect vines thus might appear to some persons to be a big job, but it isn't. You have to prune grape vines anyway, and laying them down and covering is short work. Remember clean dirt. This not only protects from frost but also from mice.

Next I would set two rows of black raspberries, leaving a space of six feet between the grape row and the first raspberry row, and also six feet between the two berry rows. For varieties I would take Older, Kansas, Cumberland or Plum Farmer. Plant Older in one row, and two of the others half and half in the remaining row. Set the plants about eighteen inches apart in the row.

Leaving a space of six feet plant a row of gooseberries and currants, half and half. Plant Downing or Josselyn for the gooseberries and London Market or Wilder for the currants.

Next I would plant two rows of strawberries, leaving a space of five feet between the row of gooseberries and currants and the first row of strawberries, with four feet between strawberry rows. Use Senator Dunlap for one row, and Warfield No. 5 for the other. These are two old and tried varieties that will give results.

This little patch of ground thus planted and well cared for will supply a good sized family with fruit the year round by employing the arts of canning and preserving.

I said nothing about blackberries and red raspberries because these varieties send up so many sucker plants that they become a nuisance, and require too much labor to keep down.

After providing space for the grapes and small fruits as above outlined, there is still left a piece of ground 19 x 100 feet enough for a wonderful garden in which can be grown all the vegetables needed or desired.

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Looking back at what has been said I will add that grape vines and gooseberry and currant plants for setting should be one year, No. 1 stock. The trellis for the grapes need not be built till the third year. The first year in Autumn, cut back the new growth to two or three buds, then cover with clean fine dirt. The second year in the spring remove the dirt covering and when growth starts remove superfluous shoots, leaving two to four; let these grow at their sweet will, simply keeping them in the line of the row to facilitate cultivation. In Autumn cover as before. Next spring build your trellis, uncover and tie up the vines to the wires, not too tightly, with any convenient material.

For the beginner it is well to know that when the raspberry plants have sent up new shoots (say fifteen or eighteen inches) the tips of each shoot should be cut or pinched off. This induces a lateral growth and will give strong, stocky canes. This heading in of the young canes needs to be done each year.

I do not like to see a lot crowded with trees. I prefer sunshine to shadow. As a rule grapes and small fruit and garden truck do not thrive well in shade. This is especially true of the grape. If, however, tree fruits are desired I would confine myself to cherries and plums. There is a well founded belief that stone fruits do better than seeded ones in our cities. The Early Richmond and Montmorency would be my choice of cherries. For plums I would plant Wyant, Hawkeye, Stoddard and others of the Americana. Above latitude 42° it does not pay to invest a cent of money or a moment of time on Japans, Japan hybrids, and the whole family of domesticas. If you have a strong desire to gamble with climate, plant just a few peach trees, our hardiest native seedlings.

The list of varieties as above named is not a hard and fast one. Neither is the plan. There are other good varieties of fruit, and other feasible designs, and no doubt the future as the years go by will have in store for us some great surprises.

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PROCEEDINGS

OF THE

SOUTHEASTERN IOWA HORTICULTURAL SOCIETY

HELD AT

Sigourney, Iowa, November 29-30, 1911

Forty-first Annual Meeting

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Snyder, S. W. ..... Center Point
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Williams, Wendell P. ..... Danville
Wilson, J. L. ..... Centerville
Woodward, H. N. ..... R. F. D. No. 1, Cedar Rapids

HONORARY LIFE MEMBERS.

Burton, Miss Helen M. ..... Cedar Rapids
Miller, A. R. ..... Washington

HONORARY MEMBERS.

Prof. G. R. Bliss ..... Ames
Mayor Wyllie ..... Sigourney
Rev. Tillman ..... Sigourney

ANNUAL MEMBER..

Bailey, Dr. L. H. ..... Sigourney
Carstensen, Andrew ..... Clinton
Langham, William ..... Cedar Rapids
*Schroeder, Henry ..... Sigourney
Schroeder, Mrs. Henry ..... Sigourney
Timble, J. N. ..... Albia
Ulm, Luther ..... Keswick
Wallschmidt, A. J. ..... Washington

*Died in Germany, Aug. 19, 1911.

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PROCEEDINGS

OF THE

SOUTHEASTERN IOWA HORTICULTURAL SOCIETY

HELD AT

Sigourney, Iowa, November 29-30, 1910

Forty-first Annual Meeting

TUESDAY, NOVEMBER 29, 2:00 P. M.

The meeting was called to order at 2:00 P. M. by President S. W. Snyder, in the assembly room of the new Court House at Sigourney.

The invocation was by W. T. Richey, of Albia.

PRESIDENT'S ADDRESS.

S. W. SNYDER, CENTER POINT.

In this, our forty-first annual session, we meet under rather discouraging conditions as viewed from a horticultural standpoint. Since our last meeting we have passed through another year's experience which has been somewhat at variance with that of any previous record since the establishment of our society.

Having as we thought safely passed the ordeal of a trying winter (though not extremely so) the first of March, 1910, came to us under warm and balmy conditions, almost summer-like, and for once, contrary to the old saying "Come in like a lamb and go out like a lion", the month of March went out even under more warm and balmy conditions than it came in, and during the entire last week of the month our bees gathered honey and pollen as if spring had come to stay. The mad rush of spring and the early summer-like conditions continued with increasing warmth and growing conditions until all of our fruit trees, vines and plants were in full bloom and the seed of the Soft Maple had grown to full size and the May-day tree had made a growth of 8 inches, when on the 16th day of

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April, which had been preceeded by a few days of unusual warmth which seemed to have aggravated and invited it, an unwelcome attack of Jack Frost came, which suddenly wiped out the glowing prospects for a bountiful crop of fruit. Freezing conditions continued for several days, and at intervals covering a period of about three weeks, Jack Frost returned to pay us a visit and to nip such fruit buds as might have escaped his former attacks.

Having passed the second installment of winter and gotten out of reach of our enemy (Jack Frost), an inventory of the horticulturist's stock in trade was about as follows: One-fourth to three fourths of a crop of strawberries, one-tenth to one-half crop of raspberries, blackberries set a full crop but was later ruined by heat and drought. Lucretia dewberries we indulged in to our entire satisfaction and regard them as the dependable crop, if rightly managed. With me, grapes made a good half crop of superior quality. Coming to the tree fruits, there was little left, perhaps one-eighth of a crop of cherries, which were mostly appropriated by the birds. Plums, on a basis of what our orchard has produced in favorable seasons, was about 5 per cent of a crop. De Soto was full enough and the fruit was of unusual size and quality. The Beatty plum did better than for a number of years, with fruit of very fine quality, large and of most beatuiful coloring. Mrs. Cleveland was another one which did well and the fruit was second to none in the orchard. Whitaker and Miner were also quite fruitful and one tree of a variety called Benson was apparently as full as the fruit could stick on, while many other varieties bore scattered specimens.

Finally, at the end of the season we could see that our plum crop would have been worth spraying and would have paid the bill had we given it good care, but under the discouriging outlook of the early part of the season this item was omitted and the curculio destroyed a good part of the fruit that escaped the destruction caused by our second installment of winter. In the apple orchard we had enough fruit for home use of summer and fall varieties, the Wealthy being the most fruitful variety while winter varieties produced only scattered specimens.

We may well ask ourselves what are we to do if such seasons are going to be of frequent recurrence. The most practical solution of the question seems to be in the employment of the invention called the orchard heater. Mr. C. E. Mincer, of Hamburg, Iowa, was successful in saving his crop of fruit by the use of the Troutman heater, and I will quote from his writing concerning the cost. The expense of heating his orchard this past spring was approximately 7c per bushel for the apples harvested. This includes the expense of equipping for the work, building an oil storage tank, tank wagons, lighters, pots, buckets, and enough oil on hand to fight another season of frost equally as bad. So that the cost of the heat actually produced this past season was far below the 7c mentioned. The cost of this protection is so cheap as compared with the returns that it would seem unwise for us not to be prepared.

But one instance has come to my notice in which an orchard bore a good crop without the aid of heaters of some kind, and that was a small

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family orchard situated on a farm where the premises are surrounded by a tall, dense grove, 30 to 60 feet in height, giving the best of forest protection from every quarter, but it will take one longer to grow this kind of protection than to grow the orchard. It is the benefits this generation received from the labors of a former generation who planted better than they knew, and seems to contradict the oft' repeated statement that the orchard should be so situated as to provide good air drainage.

One peculiarity of the season was a second crop of strawberries. Those who were keeping over old beds under fairly good conditions, were surprised to find them blossoming in early September, and in the latter part of the month and the first half of October there were many ripe strawberries gathered, some few people having so many they took them to market.

Although the April freeze was a severe test for a great many of our fruit trees and vines, they appear to have fairly well recovered from the shock, and with the possible exception of old pear trees which still look more or less sick, I believe the prospect is good for a bountiful crop of fruit next season.

Evidences of horticultural progress are to be found in the amount of hybridizing or cross breeding of fruits that has been performed in different parts of our country, which is resulting in many new fruits, out of which will doubtless come much that will be of interest to those following experimental horticulture. The enormous profits realized by those engaged in nut culture is awakening a lively interest among our most venturesome and leading horticulturists, and I believe it is time our people should take notice of our needs along this line. A few of our choicest native nuts can be grown anywhere in the state, and they will supply our needs and satisfy our appetites as well as the costly foreigners that must be shipped so far.

I think there is no doubt but that the southern part of the district covered by this society can grow several choice varieties of the English walnut. Here are specimens that grew on a tree in Erie Co., Pa., where it is said to get very cold. The tree is fifty years old and has borne fourteen crops in succession, the quality up to the average of those sent us from more tropical climates and in size equalled by none I have had the pleasure to sample. There are also several varieties of improved chestnuts that will be a success in the southern part of the state and a few of them will succeed even in the north limits of our district.

This is an age of co-operation, in which people of a certain turn of mind get together, those of certain professions, co-operate, those following certain lines of enterprise, incorporate; and in this I think is a precedent of vital importance to fruit growers. They should get together, co-operate and incorporate themselves into associations for the maintenance and equalization of prices and the wider distribution of their products, thereby preventing local gluts in the market. A number of such associations are in successful operation in widely distributed portions of our country. Every county in our state should have such an association, and fruit growers will find it to their own best interest to get into such associations and stay.

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If I may be pardoned a word personally, I will say in closing these remarks, that I have too many irons in the fire to be able to give the attention to society matters that it seems its principal officer ought to give, and I more than ever realize that the Secretary of our society is the life and moving power, and to him, more than to all other officers combined, belongs the measure of success attained in these meetings.

I wish to thank the members of this society for the honor conferred and their loyal support during my term in office. At the close of these sessions and in returning to the ranks, I hope to be able to give the full measure of loyal support to my successor in office that I have received, and to be permitted to participate in many future conventions.

F. O. HARRINGTON: I have a number of English walnuts growing on my farm at Williamsburg.

THE PRESIDENT: The tree that bore these nuts was brought from Germany many years ago.

The English walnut is as hardy as the peach. I believe it can be grown successfully in the southern part of our district.

MILLARD HARRINGTON: I had four trees of English walnut, but they were killed to the ground.

W. T. RICHEY: How old must these walnut trees be before they begin to bear?

F. O. HARRINGTON: About the same age as an apple tree.

W. T. RICHEY: I know of one old tree that has never born a nut. People hesitate to plant English walnuts because they have not been fruitful.

How close should the trees be planted?

THE PRESIDENT: They need a little more room than apple trees.

J. L. WILSON: Will the nuts fill as well here as they do farther south?

What kind of soil would you plant them in?

THE PRESIDENT: We work them on Black walnut. I think the soil that suits the Black walnut would do for the English walnut.

F. O. HARRINGTON: The soil should be rich. The first and second year is the crucial period in the life of these seedlings.

Only a few varieties bear well with us.

E. TATUM: I have four English walnut trees from California; they froze to the ground, one has come up again. I do not know what variety they were.

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SECRETARY'S REPORT.

The year 1910 will not be remembered as one that produced a large crop of fruit, but the high temperature early in the season and its effect on trees and other plants will not be forgotten for some time. We have no record of such long continued high temperature at that season since orchards were planted in the state, and we hope, should it occur again, that no freezing temperature will follow it so closely to again destroy the crop of tree fruits.

This may be an opportune time for us to take a restrospective view of the fruit industries of the state to get a clearer conception of their true condition and what improvement could be made in the near future.

Sixty years ago Iowa was sparsely settled, land was cheap, and settlers were buoyant with hope of success in fruit culture. The "boomer" was here then, as he is elsewhere now, extolling the inexhaustible richness of the soil. "You can grow anything in this soil," was not an infrequent exclamation of the land agent, as well as the equally enthusiastic settler. Groves, orchards and vineyards were planted promiscuously with fruit trees and vines of every variety on all kind of soils and the results are evident everywhere, and need no further comment. It has taken all these years to learn what we should have known from the beginning that the proposition was misleading, because it was not in harmony with the laws of nature. One never seems to appreciate the full value of a statement until he has had some experience with it. We seldom think of the intense heat of a fire until we have put our hands into the flame.

A resume of fruit growing in this state may be briefly stated as follows: Many of the young orchards that lived bore clean, perfect fruit at first because there were few insects or fungi to mar them; the supply soon exceeded the demand and was sold at a very low price after the local market had received all it needed for immediate use. Shipping facilities were poor in those early days when there were only a few miles of railway within the state. Fungous diseases and insect enemies multiplied rapidly. Cold storage for fruit was unknown and many apples rotted in the orchards because there was no demand for them. Enthusiasm in orcharding under such conditions declined, as it would in any other business that did not pay at least a small dividend on the capital and labor invested in it. Orchards were sown to grass and pastured by stock to help swell the gross income from the farm. The fruit offered for sale was in harmony with the careless methods used in growing it, and would not grade No. 2 in any market. Now I hope this is not too dark a picture of many farm orchards in this state at the present time.

This period in the development of fruit culture in the Mississippi valley has not been without results. Many problems have been solved that if properly applied will bring success in commercial orcharding. The control of insect pests and fungous diseases have been pretty thoroughly settled. The fruit grower can wage as successful a warfare against these foes of the orchard as the farmer does against the weeds in his corn

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field. Cold storage for perishable fruits has passed the experimental stage and is now in general use in all commercial centers. Rapid transit over an almost continuous network of railways covering a large area in the country has made possible a better distribution of fruits. Communication by telephone and telegraph has brought the commercial world to our doorstep. The rapid increase of wealth in America has made it possible to pay higher prices for better grades of fruit, and has also raised to a higher plane the commercial pack of the products of the orchard and garden.

To summarize what appears to be the lessons learned from past experience in fruit culture in this state in sixty years: I would say to those wishing to engage in commercial orcharding, that if they would be successful in the venture they must choose a location with soil adapted to the fruit trees desired, then give them the best of care to secure a good, healthy growth early in the season that will mature the wood before cold weather comes; prune to secure a low open head; spray thoroughly and systematically to protect the trees from insects and fungi; pick the fruit carefully when sufficiently ripe—grade it to size and color, and pack firmly in attractive packages. The slovenly methods of the past must be abandoned if success is to be attained in fruit culture. The day has passed when wormy, scabby apples will be admitted to a place in the best markets. Apples of highest quality with tender flesh will not only be wrapped with paper, but will also be put into cartons when packed to prevent injury during transportation. Will it pay? Yes, when we produce the fruit, but such fruit cannot be sold at the same price paid for an inferior grade. This brings us to the problem of selling the products of the orchard and garden at a profit.

The fruit grower may follow one of three methods in disposing of his fruit; he may sell it direct to the consumer or dealer, through commission houses, or a fruit growers' association. To sell fruit requires as much skill as it does to grow it and the profits should be about equally divided between these two accounts.

When the grower decides to be his own salesman he should obtain all the information available on the condition of the crop throughout the country and the prices it will sell for in different markets so that he may send what he has for sale to the section offering the largest net profit. He should know before his fruit is ready for delivery where he can sell it and at what price. To obtain this information requires a large correspondence or a canvass of the district in which he intends to sell the fruit.

When a grower decides to sell his fruit through commission houses he should select carefully the men to whom he intrusts his business. He should know them personally and the kind of stock they sell, and when he has made choice he should depend on their ability to give him good service. He should occasionally follow a shipment to see if it arrives in as good condition as he thought it would. It sometimes happens that when the fruit is opened and exposed for sale many a bright dream has been shattered and the estimate of the packers ability wonderfully modified.

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The indiscriminate sending of fruits to commission houses without a thorough knowledge of the men and their business methods usually result in disappointment.

Fruit growers' associations are of recent origin and have developed more rapidly in the west and south than elsewhere, due probably to the cost of transportation, as only the best fruit from these districts remote from the center of population could compete in our markets and leave a margin of profit to the grower after these charges were paid. The success of these associations has come from the high grade of fruit sent out under their brands. This grade was secured by rigid inspection, no grower was allowed to pack his own fruit.

There are advantages in selling fruit through an association. A greater quantity of fruit can be shipped from a station in a single shipment, making possible car-load lots where only a small quantity of fruit is raised by each grower, thus saving in transportation charges. It also insures a more uniform grade and pack than could be secured if each grower packed and shipped his own fuit. Dealers can afford to pay better prices when they can obtain what fruit they need in one or two places than when they must canvass a larger territory to obtain it.

It appears to me that there is no phase of fruit culture that needs attention so badly as does that of marketing the products of the orchard in a more systematic manner so it will give a larger reward to the grower for raising it.

REPORT OF TREASURER.

F. O. HARRINGTON, WILLIAMSBURG.

RECEIPTS.

Jan. 1, 1910, by balance on hand	$ 77.98	
Feb. 15, cash from State Horticultural Society, treasurer	150.00	
Nov. 30, one life membership	5.00	
Nov. 30, eight annual memberships	8.00	
By interest at 4 per cent	7.62	
Total		$248.60

EXPENDITURES.

Nov. 30, S. W. Snyder, expenses as president	$ 7.80
Nov. 30, Wesley Greene, expenses as secretary and printing	18.35
Nov. 30, Prof. G. R. Bliss, expenses as lecturer	7.62
Nov. 30, Abner Branson, expenses as director	7.30
Nov. 30, Elwood Tatum, expenses as director and premiums	11.78
Nov. 30, W. T. Richey, premium on flowers	2.00
Nov. 30, Jno. L. Wilson, expenses as director	8.60
Nov. 30, Wendell P. Williams, expenses as director	8.37
Nov. 30, Henry Schroeder, premium	2.55

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Nov. 30, Wm. Langham, expenses as director	5.50	
Nov. 30, C. E. Deuel, expenses as director	2.99	
Nov. 30, John Bowers, expenses, supplies and premium	7.05	
Nov. 30, F. O. Harrington, expenses and premium	6.72	
Total	$ 96.63	
To balance	151.97	
Total		$248.60

DIRECTORS' REPORTS.

THE PRESIDENT: We will hear the report from the First District.

MR. TATUM: I have no written report. In a journey of over thirty miles in the district I did not see five bushels of apples. I had a few Black Annette and Rome Beauty from late bloom.

Strawberries set a fair crop, but it was cut short by drought.

Peaches went into winter quarters in poor condition; there was no fruit.

The Terry was the best plum, though not so good in quality as DeSoto. No currants or cherries.

Japan walnuts made a fine growth. Trees three inches in diameter were killed to the ground. In size and taste the nuts were much like the butternut; the shells on them were not so thin as on English walnuts.

THE PRESIDENT: We will hear the report from the Second District.

REPORT OF DIRECTOR OF SECOND DISTRICT.

WILLIAM LANGHAM, CEDAR RAPIDS.

Nineteen hundred and ten has been an abnormal season. A report of the fruit crop reads like an account of a great battle. June weather in March, and March storms in April at blooming time, presaged disaster, and such a wholesale failure it has never been my fortune or misfortune to experience.

Never have fruitgrowers so feelingly and thoroughly realized the meaning of that old aphorism, "Never put all your eggs in one basket," as they have this year.

The drought throughout the growing season further reduced the crop. The farmer has fared well, and the gardeners, considering the weather conditions, have done remarkably well. There was not much blight of apple and pear trees. Insect enemies were not so troublesome as usual.

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I have heard some persons assert that, because we had so little fruit for them to work on, we would have less of them next year. We will see.

The following summary represents the views of various fruitgrowers:

Apples, 5 per cent; pears, none; peaches, none; cherries 5 per cent; plums, 1 per cent; raspberries, 25 per cent; blackberries, 25 per cent; grapes, 30 per cent; currants, a trace; gooseberries, a trace; strawberries, 60 per cent.

There was about one-half crop of hazelnuts, a very few walnuts, and no butternuts or hickory nuts.

Japan plum trees are about all dead—a mighty small loss.

There will be the usual amount of trees and vines planted next year.

THE PRESIDENT: We will now listen to Mr. Branson, who will give the report from the Third District.

MR. BRANSON: I do not have much to report. No apples. A few peaches. The New Sharon had some bloom from reserve buds. Grapes and strawberries about half crop.

THE PRESIDENT: Mr. Williams: What can you report from the Fourth District?

MR. WILLIAMS: There was about a half crop of strawberries in the district, and possibly a third of a crop of grapes. A few plums, peaches, currants and gooseberries. No pears. Blight was very bad on apple trees. We had some fruit from old orchards, mostly Jenitons.

THE PRESIDENTS. Mr. Wilson will give the report from the Fifth District.

MR. WILSON: Strawberries gave about half a crop; that was about all the fruit we had in the district.

The following committees were appointed:

On President's Address—W. T. Richey, Millard Harrington and Elwood Tatum.

On Treasurer's Report—J. L. Wilson, A. J. Wallschmidt and C. E. Deuel.

On Resolutions—William Langham, Abner Branson and Elwood Tatum.

On Officers and Place of Meeting—W. T. Richey, A. J. Baumhoefner and S. B. Dewey.

On Awards—Prof. G. R. Bliss.

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FAILURES IN SPRAYING AND HOW TO AVOID THEM.

G. R. BLISS, AMES.

There are many causes of failure in spraying. Probably the chief of these is the fact that careful and thorough work is not done. We often get in too big a hurry and leave a tree half sprayed, only 50 per cent of the blossoms filled with the poison. The nozzles should be directed upon each tree until every crevice is soaked, every blossom filled, every twig and leaf and branch glistens with the drops of liquid. We are too sparing with the spray material. The proper amount to use depends upon the size of the tree, the way it is applied as well as other factors. On the average an adult tree in full bearing should receive 3 to 4 gallons at each application or 12 to 20 gallons during the spraying season.

If the work is imperfectly done many insects will survive and prove troublesome later. The second brood worms will be very numerous and difficult to control. The best method of destroying the second brood of the Codling Moth is the complete destruction of the first by thorough work.

The spray to be applied just after the petals fall is by all means the most important in killing the apple worm. More liquid should be applied than at any other time and a hard driving spray is essential. The stream must play upon the blossom from above, because they face upward, and must be applied with sufficient force to penetrate the row of stamens and reach the calyx-cup. Once safely deposited there the poison is ready to kill the worms at any time during the season, that they enter and commence feeding. About 85 per cent of the first brood enter the apple through the calyx. If the spray does not reach the calyx cup the worms will work havoc with the fruit regardless of the amount of liquid later applied.

Often the tops of the trees are neglected. One sometimes sees the upper branches almost bare of fruit and foliage while the lower ones are well covered, due to careless work. The tower was not high enough, the extension rods were not of sufficient length or care was not taken to thoroughy spray this part of the tree.

Another cause of partial failure may be the use of materials which are adulterated. Poisons used for spraying often vary greatly in composition and strength. This is especially true of Paris Green and London Purple purchased in bulk. Often the grower makes the mistake of patronizing some firm about which he knows nothing because it makes low prices. A man must necessarily be dependent upon the honesty of the manufacturers and dealers in purchasing spray materials. Therefore it is wise to do business with some well-known reliable firm. A law is needed on our statutes demanding that all materials of this kind put on sale be of a certain strength. Such laws are now in force in some states. They protect the reliable dealer as well as the purchaser.

There are two simple methods of testing the purity of Paris Green which should be familiar to everyone. Simply dissolve a little of the poi-

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son in a strong solution of ammonia. All of the common adulterants are insoluble in this reagent while the Paris Green is entirely soluble. Thus any solid material remaining in the ammonia must necessarily be of foreign nature.

For those who haven't ammonia on hand the following test will be useful: Crush some Paris Green into a fine powder. Any evidence of a white or yellowish color indicates adulteration. Pure Paris Green will remain a clear green in even the finest crystals. During the season of 1910 thousands of pounds of Paris Green were purchased by the potato growers of Grundy County. Many complaints were heard that it failed to do the work. In many cases the beetles were not killed but did great damage. It is probable that much of the Paris Green was weak and adulterated.

Paris Green should not contain less than 50 per cent arsenious oxid in combination with copper. Nor should it contain water soluble arsenic to exceed an equivalent of 3½ per cent arsenious oxid. If more than this amount of free arsenic is present in a solution with water it will do serious injury to the foliage.

As an insecticide lead arsenate is gradually supplanting Paris Green. While a little more expensive, it is more effective in destroying insects and is less harmful to foliage. It can be used on peach trees, while Paris Green cannot. It stays in suspension longer than Paris Green and is more adhesive, sticking to the foliage better and showing more plainly. Hence it is likely to prove cheaper and more satisfactory in the long run. It is rather more difficult to prepare and for this reason many prefer to purchase the commercial brands. Some of them are quite reliable. In the paste form Lead Arsenate should contain not more than 50 per cent water and not less than 12½ per cent arsenic oxid. In the dry form it should contain at least 24 per cent of arsenic oxid and not over 3 per cent of soluble impurities. It is wise to use a reliable brand. It will cost more than the home made product. If one has had experience and needs a large quantity it will be more economical to purchase sugar of lead and sodium arsenate and make it up at home.

Another frequent source of trouble is the spray machine. Generally the inexperienced man who decides to spray his orchard or potatoes makes the mistake of purchasing a cheap machine. Often he discards it the first season and purchases one of better quality and higher price. A barrel pump is fairly satisfactory in an orchard of less than 4 or 5 acres. When one passes this limit it is advisable to use a power sprayer of some kind. A traction machine is not satisfactory in Iowa especially on hilly land. It necessitates too much hauling of heavy tanks of spray through the orchard. Often one has to leave every other tree in order to keep up sufficient power. Generally speaking, a good gasoline engine is the best source of power. Less horse power is needed as the machine can remain stationary if necessary while 4 or 5 trees are being sprayed. On steep hill sides long lines of hose can be used and trees located in gulches or inaccessible places may be sprayed without taking the machine near them.

A steady pressure of at least 125 lbs. per square inch should be kept

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up, 150 lbs. is better. It is difficult to maintain this pressure by hand or by traction power. All working parts of the machine coming in contact with the liquid should be lined with brass. Copper sulphate and many other spray materials rust or corrode iron rapidly.

A good agitator is always essential. The liquid must be stirred constantly, otherwise the solids settle to the bottom, the first spray applied will be weak and inefficient and the last from each load will be so strong that it will burn the fruit and foliage. Use a good strainer and take out all lumps, dirt or other impurities. This will save much annoyance caused by clogging of the nozzles. For general purposes a good nozzle of the Vermoral type is best. These throw the spray as a fine mist. Just after the blossoms fall the Friend or Bordeaux nozzles give excellent results as they throw a slightly coarser spray with great force.

Too often the lime has been permitted to become air slaked. It is best to get fresh lime. It is used in nearly all spray mixtures. It plays no part in killing the insect or fungus but serves the purpose of protecting the foliage against injury. Its use in Bordeaux Mixture is to take up the free copper which is deadly to plants. In Paris Green, lead arsenate and other arsenical poisons it takes up the free arsenic. Hence it is always essential to have plenty of good strong lime. Neither airslaked lime, powdered or "new process" lime nor any other than fresh stone lime should be used. Sift out all slaked lime before using. It can be purchased very cheaply. For work around the house and garden a nickel's worth is sufficient. For orchard or field spraying it can be purchased in bulk for less than one cent per pound.

It is best to slack all the lime needed for the entire season at once rather than attempt to keep it on hand away from the air. Break up into small lumps and cover with water. As the slaking progresses stir occasionally and keep the lime always under water. When it has become a smooth paste keep it covered with water throughout the summer, taking out what is needed from time to time. In following this method one cannot find the accurate weight and it is necessary to use the test of potassium ferrocyanide when making Bordeaux Mixture. In the preparation of Paris Green one can usually estimate closely enough. It is not wise to use too great an excess of lime because it is likely to clog the nozzles.

The protection of plants against insects and diseases by spraying is really a simple process. It may naturally be divided into four common lines of treatment, viz.:

1. The use of a fungicide to kill fungous diseases. Bordeaux Mixture is the standard poison for this purpose.

2. The use of an arsenical poison (a poison with arsenic as its base) in controlling biting insects. Lead arsenate is best.

3. The use of a contact insecticide such as kerosene emulsion or whale-oil soap in destroying sucking insects.

4. The use of lime sulphur wash as a winter or early spring spray against scale insects.

It is well to keep these facts in mind. There is nothing which need confuse one. A reasonable familiarity with the insect or fungus will en-

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able one to know what spray mixture to use. Very frequently the wrong material is used. It is absolutely essential that the spray be applied in due season. If it is delayed two or three days the results may be disastrous. Sometimes rains or high winds interfere. Unless absolutely necessary the weather should not be permitted to stop the work or delay it. This is probably the most common cause of unsatisfactory spraying.

In many cases the second brood of the codling moth is permitted to do more damage than the first because the spraying is done too late or is not done at all. Sometimes two applications are necessary to control this brood as the insects do not appear at all simultaneously but the time may reach over two or three weeks, usually from July 15th to Aug. 1st or even later.

In conclusion it is well to summarize with a few principles which should be kept in mind whenever spraying is attempted.

1. See that the mixture is properly prepared.
2. Be sure that the mixture contains enough lime to take up all the free poison and prevent injury to the plant.
3. Strain thoroughly and get out all solid particles before putting the mixture in the sprayer. Otherwise the nozzles will clog.
4. Use a good nozzle. The Vermorel nozzles throw the finest spray. The Friend or Bordeaux nozzles are best for high pressure spraying.
5. Have a good agitator in the sprayer and keep the liquid stirred constantly so that it will be uniform in strength.
6. As a rule the higher the pressure the better the results. Low pressure hand machines will serve around the house but in the field or orchard a constant pressure of at least 120 lbs. per square inch should be maintained. 150 to 160 lbs. is better.
7. Don't do the work hastily or half heartedly. Spray the plant or tree until every leaf, every twig, every blossom, every crevice, is saturated and the material can be seen glistening on the tips of the leaves and dripping to the ground.
8. When spraying trees use a long extension rod and spray as much as possible from above. The blossoms nearly face all upward and should be filled with the poison.
9. Don't fool with a worthless machine. Use one which will throw a fine, uniform mist and which will not wear one out in keeping up the pressure.
10. See that all working parts coming in contact with the liquid are lined with brass. Iron or steel will soon rust out in contact with chemicals.
11. Don't forget the second brood of the codling moth.
12. Don't try to spray a five acre potato field with a knapsack sprayer. Mount a barrel pump on a cart pulled by a horse or buy a regular 2 or 4 row machine.
13. Above all do the work the day it should be done.

F. O. HARRINGTON: Is it not a fact that the use of large quantities of copper sulphate causes russeting of the fruit?

G. R. BLISS: Yes. I have asked a good many growers at the

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meeting in Council Bluffs that question and they said use Lime-Sulphur.

F. O. HARRINGTON: I prefer the 3-4-50 Bordeaux mixture. I have tried the Lime-Sulphur and do not like it. It is very corrosive and not pleasant to apply.

I have two machines with tank capacity of 200 gallons each. I slake eighteen to twenty pounds of lime for each tank full of the mixture. It takes about an hour to slake the lime under water. I prefer to have an excess of lime.

J. L. WILSON: I think the lime should stand longer to make a good putty. The lime should be slaked so as not to contain hard lumps.

F. O. HARRINGTON: We have less trouble from small lumps in the lime when it is slaked under water than when exposed to the air. We mix the arsenate of lead and it only costs about one-third as much as the manufactured article.

Paris green is insoluable in water and settles rapidly in the tank unless agitated. It is cheaper than arsenate of lead but not as good for general use on account of the varying strength of the mixture.

ELWOOD TATUM: I used Lime-Sulphur this year and prefer it to the Bordeaux mixture. It did not clog the nozzles as often as the Bordeaux mixture.

TUESDAY EVENING SESSION.

The Society was called to order at 8:00 P. M. The first number on the program was an address of welcome by Mayor Wyllie and a response by W. T. Richey. (These papers have not been received for publication.)

On motion of Mr. Langham, Mayor Wyllie was made an honorary member of the society.

TEMPTATIONS.

JOHN L. WILSON, CENTERVILLE.

As all people in every walk of life are tempted at times, I shall try to talk on this subject as it applies to the horticulturist.

You will no doubt wonder why this subject.

I had engaged a load of old hay for mulching purposes, from a reliable man at so much per load, having in mind an average load of hay, and the

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party had just arrived with about 500 lbs. or less, when a letter came from our secretary asking me to prepare a short paper for this meeting. The only thing I could think about for the next 24 hours was "Temptations," and the next time I buy hay by the load, I will expect a load on a little boy's hand wagon.

But brethren, how much does this man with the hay differ from some of us berry growers? We sell berries in boxes at so much a box and the public have in mind a quart or pint. When they make too loud a kick, we tell them the boxes are wine measure, or something like that, and that we sell them by the box, quantity not guaranteed. This last season I sold my red raspberries at 15 cents per box, and a quart of berries would fill three boxes, and I was tempted to try and find a smaller box yet. But now don't all go to growing berries, for the time has been, and will come again, when the grower will have to take a full quart box and go begging for buyers at 10 cents per box.

There have been many hundreds of cases of berries consigned to our town through the express companies, that the grocers only paid the express charges and took the berries, leaving nothing for the grower.

At this time the grower is usually tempted to change his occupation.

The tendency of all business transactions is to buy under the market price, hence all grocers and others are always trying to get the price up. And, my dear friends, in these transactions is where all the temptations creep in, that wreck many business firms and send many souls to hell.

Did you ever know a groceryman that would tell any kind of a lie to get your product cheap? Or falsify your account by adding a cipher in the column where there might be a break where one would fit? I wonder if there are many such.

The most threadbare and often used lie, especially in the berry business, is the old one of, "We are going to have a carload arrive tomorrow, and berries or fruit will be cheaper, but if you will contract your entire product to me 'at a greatly reduced price,' I will take all you have and cancel the order for the car load." There never is a season passes, but I have this bluff thrown at me by nearly every merchant that handles my products, and usually all on the same day, as if it was a put-up job. And it usually happens at the time when you think one more case of berries will break the market.

I always call this time the crisis or turning point when the price will be easier to maintain, and usually go home and plan how much of a raise the market will stand for the next day. This bluff works on me about like waving a red flag in front of a mad bull, or I feel about like a merchant who has one of his best customers tell him he can buy certain articles much cheaper of Sears, Roebuck & Co.

I don't think it a good plan to contract a crop of fruit to anyone at a set price, or otherwise. There are so many unforeseen things that happen during the season, and man is so prone to evil and easily tempted, that it usually ends up in a bad way, and the time has been when if I had contracted my crop, it would have taken a man with a shotgun after each party to make us live up to the contract.

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Did you ever have a merchant set your berries in the back room, or down in the cellar, while he sells a few cases just in from the expressman, that probably only cost the express charges? This act always put me in mind of the man who sends his cash to a mail order house for what he wants, and when he gets out of employment comes to his local merchant, and asks for credit until he can get on his feet again.

The business man who gives preference to the shipped in products over what is produced in his locality from any cause whatever is a worse enemy to the community than the man who buys all his needs from a mail order house.

Many times I have arrived on the market with berries that were too good, and have been turned away for the reason that to have bought my berries would have been the cause of spoiling all the merchant had on hand and causing him a loss. The merchant in this case throws all the machinery out of gear. He not only spoils the market for the grower, but he forces a poor product on his customers, but this policy is not persisted in very long, as it shortens a groceryman's career too fast. The groceryman who turns away the opportunity to handle the local products of his community is curtailing the volume of business that is possible for him to do, and could be likened to the mail order house that would throw inquirers' letters in the waste basket unopened.

The quicker the dead beats of a community get in their work on a merchant of this kind, the better for the community.

A large per cent of the grocerymen are composed of unsuccessful farmers who have left the farm before the mortgage closed them out, moved to town, and went into the grocery business because it is so easy. He is like the unsuccessful city man who moves to the country and goes into the fruit business because it is so easy.

But lest some of you may think that I am just talking about grocerymen, I will say that I am just holding the merchant up as a mirror, so to speak, so that we can see ourselves. If I was talking to a crowd of merchants, I would tell of some of the little mean tricks we fruit growers do; but there is no need for me to tell you of these things, you all know some of them.

The Reverend W. A. Sunday has said that under the skin of the average man you will find dog, and if this is so, it behooves us to keep the dog as far under as possible.

Not long ago, I heard an address from Warden Sanders of the Fort Madison penitentiary, and this is the way he started out on us: "I feel at home here this evening, as this is about the usual sized audience that I speak to at home regularly every week, and about the only difference I see is that you haven't been caught and they have." And I have often wondered since, how much of that he meant for a joke.

But now I want to talk about some of the temptations that enter into the tree business that ultimately turn out as blessings to humanity in general.

Most people are tempted to buy trees and go into the fruit business by some tree agent offering some good-looking bait. The nurseryman and

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the tree agent put me in mind of two men who go fishing. One digs the bait while the other catches the fish. Most of the trees that are sold in this country are sold by agents, and that seems to be the most successful way of selling them.

I believe that to take all the tree agents out of the state for 50 years, we would have a country almost as barren as the desert.

Thousands of tree orders are taken each season that would be countermanded, if possible, later.

These people are coaxed and tempted until they buy something they never thought of buying until the agent came along. Such people usually take poor care of their trees, and most of them die, but a few of them live and bear abundant crops, and are a benefit and a blessing to the community.

The grower of a crop of any kind can see the hand of God in everything he does.

But the man who sells these crops has no trouble to see the hand of the devil anywhere he looks.

To say that the selling agent is worse than the producer or the buying public would be untrue, and fortunate is he who will try to find out what is the right thing to do, and then do it.

SCRAPS.

S. B. DEWEY, WASHINGTON.

My return from the south last March was the most delightful return trip I have made. It seemed the air was a perfect blaze of bloom all the way up to Burlington, Iowa. From there on to Washington the bloom was very scattering. It certainly is a royal welcome when one leaves Iowa in the winter season (snow blanketed) to find in its place on return a mantle of blossoms. And while I regretted the absence of bloom at home, we had about the same amount of fruit they had in other sections of the state, for we all too well remember the past season was almost a fruitless, nutless period, but cheer up, it might have been worse, and the coming season will amply reward our labors with the treasures of the land. Who knows but it is better to have a blank, once in a while for the good of the trees and to make us more appreciative?

In this connection I am reminded of Luther Burbank, who, after another block of years in experimenting with hundreds of thousands of plants and trees, has quietly announced the development of a very few choice flowers and fruits. What do you think of Luther anyhow? I consider modest Luther Burbank and silent Tom Edison the grandest men of their time if not of all time. They accomplish more and talk less than human nature generally permits. Their bearing is in awful contrast with the recent spectacle of one who stalked forth over the land who was all talk but nothing doing. This strenuous man did less talking and more

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execution while in Africa than in any other period of his life. Edison never said he would throw anyone through the ropes who differed with his policies; and Burbank never said he would "lick anyone to a frazzle" who did not agree with his theories. The men who do the most haven't time to talk. This explains why I am talking here tonight. The best thing Carnegie has done was giving $10,000.00 a year to Luther Burbank for ten years to enable Mr. Burbank to develop comforts, pleasures and luxuries for futurity. And Edison's twenty-four hours are too short a day for him in grinding out his wonderful benefits, I might say donations, to all mankind, for how many would want to labor continuously as he does, granting the ability was theirs. Whenever you hear of a statesman getting an annuity for a number of years to develop a broad, wise and just public policy, please let me know.

Many of the present day statesmen are vastly more concerned about a policy that will flim flam the people and obtain for his party success, or the offices. How far would it go or how much influence would bribery have on the creation of a beautiful flower, luscious fruit, or a phonograph. Sometimes I am inclined to doubt the divinity of the halo of the statesman. For as I see it, the statesman of today has as many variations as a kaleidoscope, and as many angles (political) as a weather vane. The leader of one of the great political parties has side stepped many of his former ideas while the leader of the other great party is dodging political shadows at every corner. What is a statesman, I don't know; but who is a a statesman I DO know; so do you.

PART TWO.

We should view with concern the migration from our state of so many of our best citizens. If the opportunities at home were not the very best, our lands would not be jumping in value so rapidly. So why leave a land of plenty, in mid-life to go to a new and undeveloped section and start life a-new. I have not seen all this country, but the more I see and hear of other states the more I value Iowa land.

Last winter I talked with a young man in Arkansas; he hauled wood to the city and about all he got out of it was a poor living. When I asked him why he stayed there eking out a miserable existence he replied that he had been in several other states, but because it was warmer there he could make a living easier than other states in which he lived. When I agreed with him that I preferred a mild climate in winter he grew enthusiastic and said: "Why, do you know I would not trade one spell of warm weather for two of cold." In Oklahoma and Kansas it has been so dry recently that the streams have gone out of business, pastures gone and stock sacrificed and of all places that needs lots of water it is parts of Kansas and Oklahoma. One day I noticed a couple of colored men digging up the garden for spring planting, near where I was stopping in southern Kansas, so of course I had to see how they did that business down there and went over and after sizing up the situation awhile I ventured the remark that there was losts of sand in that soil and one of them said: "Dey's got to be lots of sand for it keeps blowing away

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all de time." And only just a few days ago a Welshman just west of Columbus Junction took a load of wheat to Brighton to be ground and stopped in our local "senate" on his way and the rule is anybody has the privilege of answering any question he wants to, so among other answers he said he had lived in Oklahoma for seven years and it was drouth and hot winds so much of the time he could not make a cent and he wanted to get out of there the worst kind but couldn't sell, but one day a man turned up and asked him if he wanted to sell his place. He says, "I said no, but I did want to, as you know." However he asked how much I would take for it and I told him $4,000.00. He though that too much, but offered me $3,800. I said "no." He went away, and after a while (never expecting to see him again) he returned and renewed his offer of $3,800.00. I still said no and off he went again, but after a long time he came back and bought it. Says he, I then moved back to Iowa, bought a run down farm at $33.00 an acre ten years ago and have refused $120.00 per acre, for his farm today produces 75 bushels of corn to the acre. I then asked him why he did not let the man have his Oklahoma farm when he was so anxious to get out of that God forsaken country, *quick*, for $3,800.00, and he said because I could make a living on it in spite of all I could do.

One of our home men bought a farm five years ago at $18,000 and recently sold the same for $44,000, a net gain of over $5,000 a year, and so it goes. But I don't want to leave the impression that I am knocking on other states, for they all have more or less good features, but our premier state is beyond compare with many of the others.

PART THREE.

There is cause for alarm in the indifference manifested toward our fruits and nuts and it points to only one result, the extermination of both as civilization becomes more civilized. In our great strides of progress we have torn many of the brightest pages from nature's history.

Where are the solid miles of wild pigeons that darkened the sun in their flight; where are the wild Plymouth Rocks that used to adorn the rail fences; where are the millions of water fowl that used to sport in all streams and lakes of our country? And how long do you think the fish will survive in the onslaught of extermination and polluted streams? In the south robins are killed and brought in on a string like fish, and sold to the big hotels. All kinds of song birds were being slaughtered all over the land until laws were passed checking in some degree this dastardly work. All this tends toward the condition of poor Lo, and that grand old monarch of the plains, the buffalo.

How much do you suppose the people of the state of Iowa would give for just one day's view and experience with the birds of a generation ago? And while this is impossible, history may repeat itself in many of the desirable features of today.

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SNAPSHOTS AROUND THE RANCH.

WILLIAM LANGHAM, CEDAR RAPIDS.

Nineteen hundred ten. Each year as a great and wonderful panorama. The changing seasons give tone and character to each picture. Now fructifying rains and life-giving sunshine, transforming the earth into a paradise of beauty and loveliness. Now fields of golden grain and fruit-laden trees, and vines and shrubs and plants of almost endless varieties. Now gorgeous tints and colors and wailing winds and lengthening shadows, dark and sombre. Now repose and death.

The years as they come and go are very similar, just variation enough always forever to render the one in the present tense more charming and enjoyable than the one which preceded it.

However, 1910, now drawing to a close, will go down in Iowa horticultural history as a most remarkable exception. The editor of one of our foremost agricultural papers has called it "freakish." I do not like that word. It sounds disrespectful to the clerk of the weather. I should prefer to say, unusual or abnormal. A bill of particulars would read something like this: An extremely hot March. I pruned grape vines that entire month, and suffered from the heat as much as I did in the following June. Growth of bud and leaf and blossom was far in advance of the season. Then came the desolating arctic blasts of April, dashing the hopes and prospects alike of every fruit-grower in Iowa. This was succeeded by drought and torrid heat in June and July.

We had only .63 of an inch of moisture in June and .44 in July. In fact we had about 75 days when the rainfall at no time kept the dust down longer than 10 o'clock the next day. In retrospection I look back to those days with mingled feelings of despair and thankfulness.

The pear trees commenced to bloom on the 3d of April, and by the time of the first storm, April 17th, the young pears were as large as small peas. Not a single one was left. Even the trees—200 or more—were in many instances completely defoliated. Plum and cherry trees were in full bloom. A very small per cent of the cherries survived the first storm and the one a week later. The trees, however, retained their foliage intact. The apple blossoms went down before these fierce onsets, and not a few trees lost their leaves, as did the pears.

The vineyard—a thing of beauty and of great promise—was completely ruined. In two days after the first storm you could rub every bud into dust between your thumb and finger.

The raspberry and blackberry plantations looked as though a blighting flame had swept each row. The catastrophe seemed overwhelming, and fruit-growers with bated breath asked each each other in fear and doubt: Will the trees and vines live? Can they withstand such a terrible shock in their tender condition? There were painful days of waiting and suspense. At last the green leaf-buds began to push out on those frost-denuded trees.

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The reserve buds of the grape vines came to the front like true soldiers to snatch victory from a great reverse, and even the raspberries began slowly to put on new life. The loss of the year's crop was forgotten in the greater joy on account of that which was left us.

Despair and gloom gave way to hope and thankfulness. The story of the early outlook for fruit and the actual results for the season of 1910 is easily told. Orchard trees came out of the winter in good condition. The bloom on all varieties was ample and promised well. The vineyard was in superb shape. I never saw so much and so fine wood for fruiting. Currants and gooseberries indicated a normal yield.

Raspberry and blackkberry canes, however, suffered severe damage. I am not certain as to the cause, but as this present year has sins enough of its own placed to its credit, I am inclined to attribute it to the severe freeze of October, 1909. I have reasons for so thinking. Let me give you one. We have three patches of Mersereau blackberries, one on sandy ground, the other two on heavy clay soil. The one on sandy ground had matured its wood at the time of that freeze and came through the winter in fair shape. The two others on the heavier soil were caught with growth uncompleted, and were found dead to the very ground this spring.

Perhaps in the season of 1911 we may hear and actually see the echo (faintly, I hope) of those April storms.

As to actual results: We did not have a single pear or plum, and there were perhaps 300 trees. While there was here and there a cluster of currants, or a gooseberry, we did not pick a quart of either.

We had 50 or 60 crates of fine cherries from trees which grow on ground, sloping to the north and looking into the very jaws of death.

There was about 2 1-2 per cent of an apple crop, and the quality was on a par with the quantity. We had 25 per cent of a crop of fair raspberries and blackberries. A favorable season would have given 50 per cent.

The vineyard produced 25 to 30 per cent of a full crop of superb quality. The three varieties which did the best were the Concord, Worden and Wyoming Red. Moore's Early gave a very light yield, and the Pocklington surprised us by taking a lay-off. The Hero and Lutie which did so well last year, were hobnobbing in idleness with the Pocklington. Of the Rogers Hybrids, the Agawam did quite well, and maintained its place as one of the best.

The Wyoming Red, which is inclined to overbear, and as a consequence is small and ripens unevenly, surpassed all previous records for fine fruit. The spring frosts had thinned production to one-half, and the remaining half gave bunches which in size and color were a delight to behold.

But the Concord, the peerless, the unexcelled, the unrivalled, was the queen of the vineyard. Never before had I fully realized the great possibilities of that grape. Such wonderful clusters of large size, beautiful in outline and perfect in berry.

I make the prophecy that it will be a long time before a grape is produced which in the estimation of the public will supplant the Concord.

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Grapes this season sold per pound for double what they did last year, thus, measured in dollars, giving 50 to 60 per cent. of a full crop.

Though the spring was hot and cold by turns, and the growing season droughty and torrid, and the hopes and spirits of us horticulturists were plunged into abysmal depths of despair and discouragement, yet certainly everyone has experienced a great uplift since Jupiter Pluvius smiled on us in August. Who ever saw the earth so elegantly carpeted in green (regular Wilton velvet) as it was in September and October, 1910? Who ever saw more glorious days and genial skies? Their beauty and loveliness will linger in memory long after the bitter storms that preceded will have passed into oblivion.

Ethics of the Dust. Fruit growers and gardeners who live close to the larger towns and cities have an advantage over those who live at a distance in that they have easy access to an almost unlimited supply of fertilizing material.

For a number of years, especially the last two, we have availed ourselves of that source of supply, depending largely on the output of feed stables and livery barns. As this article was rather coarse for plowing under, it was mostly used as mulching.

We used it in the orchards, in the berry patches, in the currants and gooseberries, and in fact wherever a mulch was needed.

There is no question as to its manurial value and its beneficial effect on plant growth.

But there are some minor drawbacks. We had mulched our vineyard heavily (in the rows) last autumn, and since that time the disintegrated action of the elements has made some startling revelations. There were stones and brickbats, coal and clinkers, broken pottery and crockery and hardware, pieces of all kinds of harness, tin cans and baling wire in profusion. Such things may be ornamental, but they are not good for sharp-edged tools. However, the most picturesque and spectacular of all were the bottles. They were of every size, shape, color, and quality this side of perdition. By another season we may be able to fit out a drug store or a high-class saloon, perhaps both. There were also divers and sundry specimens of cast-off clothing representing about all the material, styles and colors on the market; so far, however, we have not succeeded in finding a full suit.

But there was a more serious side to the matter. When vegetation came forward this spring we were surprised at the multitude of plants which had never before appeared or been seen in our fruit plantations. In addition to our familiar native species, there were many new and unknown ones. Every cereal within my limited range of knowledge was represented. There was a wonderful display of weeds in size from small to very large. One in particular of unknown antecedents was of gigantic proportions and grew with alarming rapidity. Before we had realized the gravity of the situation it had far overtopped the grape vines and they are on a five-foot trellis. It took several days to bring it under subjection. If it had been a trifle larger we could have utilized it for firewood. There were some very handsome plants and several very pretty little vines, but I was not in an appreciative mood.

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That vineyard would have been a paradise for Professors Macbride and Shimek of the State University, and Professor Pammel of the State Agricultural College at Ames. They could have wandered through that rich and rare exotic flora with increasing pleasure at every step, and in comparison, looked with disdain and contempt on the paltry treasures which the Philippines, Porto Rico, and other insular possessions of the United States could offer in this line. But I was so unsympathetic and so deaf to the claims of science that I used the hoe unsparingly on these rare and valuable botanical specimens.

What of the Future? "Hope springs eternal," and I see no good reason for discouragement. The great catastrophe which befell the fruit industry was not local. Our sister states North and South, East and West, suffered with us. This season has been merely a meteorological caprice. Perhaps it may have never occurred before, and may never occur again.

The outlook for 1911 is auspicious. Notwithstanding the abnormal season, the growth of wood and bud on tree and vine has been good, and the autumn has been highly favorable to their maturity. I am told by competent authority that nature has made ample preparations for a bountiful crop this coming year.

The word *Iowa* is of Indian origin, and signifies "the place."

Many years ago, perhaps even centuries ago, a tribe of Indians came into this country, having abandoned their old home from choice, or more likely from stress of war. When in wonder and astonishment they gazed out over the illimitable and matchless prairies and forest-crowned hills and valleys with herds of deer and elk and bison never out of view, and when with increasing delight they beheld the many clear and sparkling streams and rivers and crystal lakes teeming with fish and haunted by the beaver and the otter, they with one accord exclaimed "*Iowa.*" *This is the place.* This goodly land was to them alike the end of their weary pilgrimage and the goal of their fondest dreams.

Today, under modern civilization, Iowa is to me what it was to the Indians when they first saw it. I look out over those same magnificent prairies, and I see them dotted with the pleasant homes and cities of a great state. On every hand are fields of waving grain and orchards and vine-clad slopes and cattle on a thousand hills. I behold the same beautiful streams and rivers and lakes, reflecting as of yore the blue dome of heaven by day and the starry hosts by night, but they have been put under restraint for the use and pleasure of man. The picture, complete and true, stirs me deeply and with the red men of old I exclaim, *Iowa. This is the place.*

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PLANTING ORNAMENTAL SHRUBS AND PLANTS TO BEAUTIFY THE HOME.

A. J. BAUMHOEFNER, CEDAR RAPIDS.

It seems almost inexplicable why so many homes are without ornamental shrubs or plants.

In roaming around the country, as we grafters of the grafters' art are prone to do, and as often said, "in search of whom we may devour," there are so many homes without even an ornamental shrub, no not even a peony, to cheer the father, mother or children with their flowers and their beauty. What is there as beautiful as a bed of peonies, when they are in full bloom, with their magnificent array of colors, or a Spirea Van Houttei, with its wreathlike white flowers, and many other shrubs and plants with their different shades and colors of flowers and foliage?

Give the children some shrubs and plants to care for when they are small, and they will learn to love them and care for them, and as the years roll by, and they have grown to manhood and womanhood, and go out into the world, they will always be glad to return to the old home and see the shrubs and plants they planted in their childhood days.

Make your homes more beautiful, and your boys and girls will not want to leave the farm and go to the cities.

Show me the individual who loves flowers, and I will show you an individual with a love of human kindness in his soul.

In planting ornamental shrubs and plants, do not plant them singly. Plant them in groups or beds. Plant in corners, and as borders, also the back yard, to shut off the back yard view. If planted in groups and beds, they will be easy to take care of, mulch or hoe, and will not be in the way when you mow your lawn.

In planting, use the tall shrubs on the back, and the smaller in front; some of the herbaceous plants make good borders; the Iris, for example.

For early flowering shrubs, plant white and pink almonds, snowballs, lilacs, different kinds, flowering currants, mock oranges, Wiegelias and Spirea Van Houtti. For later flowers, plant Deutzia, Hydrangea paniculata grandiflora, Hydrangea arborescens (Hills of Snow), a very good flower and very showy, Spirea Anthony Waterer, and many others. Of the hardy, herbaceous plants, the peony is the queen of all; it will grow with less care than any of the others. For real early flowers, plant the single Paeonia officinalis, then the dark red, red, white, pink, and the Rosea for later, and you will have flowers for about six weeks. Irises are very hardy. Achillea (the Pearl, a small white double flower), bleeding-heart, asters, sweet williams, yucca, phlox, and many others, are very good for borders. Golden Glow is excellent for screens.

For hedging, use Thunberg's barberry, or the purple-leaved; they are hardy. The California and Amoor privet are not very hardy.

In closing, I ask, "Is there any shrub, plant, vine or creeper too sweet or beatuiful to plant in your home grounds?" I hear you answer, "Nothing too fine, too sweet, or too beautiful."

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So let us all plant more shrubs and plants to make our homes more beautiful.

W. T. RICHEY: Planting ornamentals in the back-yard makes it more attractive. It surely helps to elevate and refine people who live in such surroundings.

J. L. WILSON: Many people do not treat the plants properly. You can not expect hydrangeas to give blooms nine inches in diameter unless you mulch the plants or give them plenty of water.

E. TATUM: The Magnolia Soulangana deserves more attention than it has received. The tree is as hardy as a peach tree, and the flowers last as well as the tulip.

(The address on "Boost Iowa" by A. R. Miller was not received for publication.)

WEDNESDAY MORNING SESSION.

The meeting was called to order at 9:00 o'clock by President S. W. Snyder.

The invocation was by the Reverend Tillman, of Sigourney.

EARLY EXPERIENCES IN HORTICULTURE.

ABNER BRANSON, OSKALOOSA.

My father came to Iowa in 1853 from Ohio, and located at West Branch, twelve miles east of Iowa City, where he built a log cabin on the prairie. The first grapes grown were Isabella, grafted on the roots of the wild grape. I covered the grafts with clay and banked with soil. Our nearest market was Muscatine. Father brought some peach pits from there which I planted in the garden. I also planted pits of a yellow wild plum, but they bore red fruit.

The Early Richmond has been the most profitable cherry. The Late Richmond has never borne fruit enough to pay for the space it occupied in the orchard.

The Wallbridge apple is not worthy of much notice as a commercial fruit. Utter's Red had done well and should be more extensively planted. The Willow-twig is valuable for keeping quality of its fruit. The Wagner is a good nurse tree, or to use as a filler to be removed when the permanent tree needs the space. It is an early bearing, productive variety of good quality.

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WHAT SHALL WE PLANT?

C. E. DEUEL, WASHINGTON.

If I was limited to one kind of fruit, I would take the apple, for there is no fruit that can fill so many places as it does. Every home should grow some kind of fruit. Those that have room should plant some apple trees. In selecting your trees, do not get very many varieties. Out of the many hundred varieties on the market, there are only a few well adapted to your soil and locality.

If you have black loam, I hardly think that it would pay to set with Jonathan or Romanstem; or even Grimes Golden will not pay very large profits.

Those that have pear soil should plant a few pears. I think that they are nearly a failure on our prairie soil, and would not recommend them, although the largest tree that I ever saw in Iowa is on a deep black soil, and is now twenty inches through at the ground.

In the plums plant nothing but natives.

There is no fruit that seems to suit everybody so well as the strawberry does in its season, and no fruit that we can get returns from so quickly. I think that every home should have a patch. One hundred to 150 plants well cultivated will furnish all the fruit that an ordinary family can use.

In setting your beds, get the best plants that you can, and good plant makers; set them not less than three feet by four feet. One of the greatest troubles is too many plants. One of our customers set 350 plants on a piece of ground 12 x 18 feet, and then complained that the berries were small. The variety set was Dunlap.

While we are planting our fruit, we must not forget that no home is complete without a good supply of flowers. The queen of all flowers is the rose. In ordinary years you can have abundance of bloom with very little expense and labor.

Plant a few shrubs—Spireas, Hydrangeas, also some Phlox, they will bloom from June until frost, perfectly hardy and nearly all colors. We had some this year that the bloom was as large as a silver dollar.

AN ACRE OF LAND.

WESLEY GREENE, DAVENPORT.

What is there in an acre of land to the man who would fathom its possibilities as a reward for the efforts of a life time; will it bring him to a palace or a hovel? The answer to this query depends largely on the man. Soil is only the agency through which he must work, though there are conditions sometimes which he can not control that may bring disaster, or very materially reduce the profits of the venture. Let me cite a few examples gathered by observation and experience in soil culture that may throw some light on this question.

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In the early '60's a young man raised 600 bushels of onions to the acre; when the crop was ready for market the political condition of the country was such that business activities had been paralyzed and he was only offered five cents a bushel for them; not enough to pay for harvesting and delivering the onions in the market even at the low wages paid for labor at that time. In an effort to secure something for his labor he kept the greater part of the crop until the next spring, but without success, for the price was only one cent higher. It is needless to say that those onions were used as a fertilizer for other crops and the labor in growing and caring for them was charged to the debtor side of the ledge. This experience did not inspire confidence in the young man that onion culture was a safe investment for labor or capital.

The next venture was with barley, which gave thirty-five bushels to the acre and sold for $2.25 a bushel, or $78.75 an acre. This result was obtained from land that could have been bought for $30.00 an acre. The political crisis had passed and hope in the future security of the government had given new life to business enterprises and created a demand for all products of the soil. If this party had been able to sustain the loss in onion culture until the change in price occurred he would have gained more than he had lost on former crops; but such have been the experience of all that launch ventures in the commercial sea; squalls have strewn inhospitable rocks with wreckage of frail crafts.

The next incident was where a man failed through ignorance, or poor management. This party rented land at $25.00 an acre and planted it to onions; the seed was poor and less than half a stand of plants was secured; later these were plowed under and the ground planted to potatoes; as the season advanced the Colorado beetles defoliated the plants and not a tuber was found large enough for market. This occurred before a remedy had been found to control these beetles. The venture was a complete failure, involving not only the money paid for the use of the land, but seed for two crops and the labor of planting and cultivating them.

A few years later the same land was planted to potatoes and produced 500 bushels to the acre, that sold for thirty-five cents a bushel, or $175.00 an acre. This was a very satisfactory crop, but the onion proposition was a better one for land adjoining produced 800 bushels of onions that sold for forty cents a bushel, or $320.00 an acre. I have heard of 1,200 bushels being grown on an acre, but have never seen such a yield, but have grown eight bushels of transplanted Prizetaker onions on a square rod of ground, that was at the rate of 1,280 bushels to the acre. These onions sold at seventy-five cents a bushel, or at the rate of $960.00 to the acre.

Ten years later the ledger shows a different condition; the same land produced 200 bushels of potatoes to the acre that would only bring eight cents a bushel on the local market. It is needless to say the entire crop was fed to stock. This occurred when cities were buying potatoes for "soup-houses" to feed unemployed workmen and their families.

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Several years ago an orchard produced 500 bushels of apples, which when carefully graded sold for $2.50 per bushel, or $1,250 for the crop; a very good income from an acre of land.

Not long since a ginseng specialist made an estimate from the sale of dried roots and seeds obtained from one-seventh of an acre of these plants, that an acre, at the same rate, would yield $21,000.00. That, however, is not the limit of the productive capacity of an acre of good land. I know of a case where 400 square feet of greenhouse bench produced $60.00 in radishes, $100.00 in lettuce, $360.00 from cannas, and $200.00 from the sale of chrysanthemum blooms, or a total of $720.00 in twelve months; $1.80 per square foot. If this result could be obtained from every square foot under glass on an acre it would amount to more than $78,000.00. If you deduct one-fourth for walks it would still leave more than $50,000.00 in gross receipts to the acre. Some florists claim to have produced more than $2.00 per square foot of glass in a year from their greenhouses. $100,000.00 a year may not exceed the value of the product from an acre of good soil under intensive cultivation with skillful management in disposing of the product.

Another example and we will not tax your patience longer with statements that seem almost incredible. Under intensive methods of soil culture gladiolus bulbs may be grown at the rate of 100,000 to the acre. If these bulbs were of a good grade worth $15.00 per hundred, or twenty cents each, an acre of them at that rate would be worth $20,000.00 to $30,000.00. The spikes are worth two to three cents each wholesale, so we may add $3,000.00 to $5,000.00 for the bloom. A handsome income from a single crop. If you made the rows wide enough apart to use a horse in cultivating them you would reduce the number of bulbs to 50,000; then if they were the common kinds worth only $1.00 per hundred the gross receipts would drop to $5,000.00; then if you could not sell the bulbs you would be in position to condole with the man that raised onions for six cents a bushel.

In the cases cited I have only mentioned the amount received for the crops without deducting therefrom the cost of producing them. The productive capacity of an acre of land is determined largely by the amount of gray matter expended in the cultivation and in the sale of the crops raised on it.

TWENTY YEARS EXPERIENCE IN HORTICULTURE.

HENRY SCHROEDER, SIGOURNEY.

It soon makes twenty-five years, when I commenced to keep a record for my customers in Keokuk county so we could keep good track of what varieties they planted and which do the best. Before there had always been so much complaint that it did not pay to raise fruit here, and trees would not be true to name. 1910 is without fruit here on account of the very late frost last spring and the early bloom, but we should not give up hope, but continue planting. For now we can see how much more

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fruit has been shipped in than out of the county and money shipped out instead of in for other improvements.

Why I commenced to keep a record for my customers. Now, when I want to know something about varieties, how it does on different soils in Keokuk county, it pleases me, but if I had fooled my customers, I should have fooled myself, also other nurseries from whom I bought certain varieties and they were true to name, why should I not buy of them again. But we never get too old to learn so we can do better. Where the land lays right for an orchard, the rows should be planted north and south, not so many rows north and south, but longer rows, and east and west farther apart, to give better air and sunlight north and south, and in these rows north and south plant the trees thicker. The more different varieties mixed, the better fruit from flowers, by pollenizing, and as the trees grow larger it is cheaper to cut some limbs or trees out to give more room for the best, instead of planting between old trees, that have the advantage. Besides, times are improving, so this agrees better too, for plowing, cultivating, grass mowing, manure spreading and such other work. When anyone wants the fruit to be growing, or the brush, it makes a difference from the soil, and north and south rows better against sun burning on trees.

One complaint in Keokuk county is that we raise too many summer and fall, and not enough winter apples. Why? Well, by looking in catalogues or at the pictures from agents they generally start with the other fruit first, and winter apples last, and besides with the replacing or for meals, and horse feeding, how easy with substituting can they get to less winter apples? The more agents the less chance a home nursery. Over fifteen have here in Keokuk county started a nursery but no one lasted long on account of dealing with agents first, and at home nurseries last, when it was too late for the season.

HOW CAN WE INCREASE THE INTEREST AND ATTENDANCE AT OUR ANNUAL HORTICULTURAL SOCIETY MEETING?

W. T. RICHEY, ALBIA.

The object of this paper will be more to bring out some discussion along this line than to give full details of how the thing should be accomplished. However, we will endeavor to give a few suggestions along these lines. First, we would suggest when the place of meeting has been determined, that we get the local papers to note the fact, and that we begin talking it ourselves, and try to get as many interested as possible, and that we call attention to the fact that the annual meeting of the Horticultural Society will meet in our city, and farmers, gardeners, and florists cannot afford to miss these meetings, for they are for their special benefit. Then, we should not forget to interest the school children in the growing of fruits and flowers. I believe horticulture should be taught in our schools, showing some of the benefits derived from the use of fruits, and of the pleasures derived from the cultivation of flowers. Telling of the healthfulness of the fruits, and the refining influence of the flowers.

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Then we can help along these lines by assisting when our secretary asks us to write a paper on some horticultural topic, and not say, "Oh, I can't," thus turning not only the secretary down, but turning the society down, for it may be that the society just needs your experience, and you may be able to encourage someone that has become disheartened, and they will take on new life, and thus accomplish much more than if you had not written.

Then, we may help by exhibiting our product. I believe in giving good liberal premiums, and if we fail to secure a prize the first time, let us not be discouraged, but try again, making up our minds that we will profit by our former experience, and make the other fellow "go some" if he "gets there" next year.

Then, I believe we might make our meetings of more interest if we would have special sessions for the children, with practical illustrations on grafting, budding and the propagation of plants and flowers, thus interesting the young and rising generation along the lines of horticulture and flower culture. But there is so much that could be said, and the subject begins to broaden and expand as we begin writing, and as the object of this paper was to bring out some discussion, I will close lest my paper be too long.

WEDNESDAY AFTERNOON SESSION.

The meeting was called to order by President S. W. Snyder at 2:00 o'clock. The first number on the program was Lemon Pie, W. P. Williams, of Danville.

LEMON PIE.

WENDELL P. WILLIAMS, DANVILLE.

We had one gooseberry pie. We had pretty bad luck this year, but I'm not a kicker. Everybody has his own reasons for not being a kicker. There are many good ones.

When in the spring our orchards promised a fine crop, the women folk, with the remark that fruit kept two years tasted old anyway, dished out most of what remained of the 1909 crop to us hungry folk. Winter came early and though lemon pie wasn't invented this year, it would have been if it had not been for some grandmother's ingenuity. People went after rhubarb beds more eagerly than cattle after blue grass in the spring. Practically everything imaginable was canned. Everybody worked overtime in the garden; further than this we did not need to look for substitutes; the local storekeepers did that.

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Sometimes the fruit crop is spoiled by a late spell of winter weather, but this time it was by an early dash. I think I'll try heating some next spring, but I don't know anything about that now. What I think irregular weather tells us to do is to have variety in our home orchards.

Even this year there was about one-half of a crop of strawberries, one-third of grapes, and quite a few plums and some peaches. Also, had there been any well-kept blackberry patches in the neighborhood, I believe we would have had some.

I believe if the average farmer would set out a smaller orchard, and take better care of it, he would get larger returns. The average farmer sets out from fifty to an hundred apple trees, a few seedling peach, and three or four cherry trees. I believe this is a mistake. I do not intend to give advice about home orchards, but I want to parade a few of my own ideas.

I believe the American, Domestic, and Japanese plums should all be planted. Our one tree of Golden is a great success. I don't see why others should not be. The Green Gage is my favorite plum for canning. Col. Brackett said he was surprised that I could grow it in my locality; he did not say why. They don't live very long, but I keep setting out young trees. I'll never give it up. The German Prune is the healthiest Domestica and the largest yielder. The American plums have lost reputation because after setting a large amount of fruit they drop the greatest part of it—I think perhaps that is caused by a lack of cross-pollination.

In peach growing the easiest and surest way of getting fruit is from seedlings, though it is inferior. My idea is to set half seedlings, half budded trees, give the budded trees the choice locations, and fill every nook and corner with seedlings. Be careful what seeds you plant. I believe there are better varieties than Elberta. I thought of trying Champion and Banner for the good peaches. We have an apricot tree; it seems hardier than the peach, but blooms very early. I know there are lots of grapes better than Concord. I'm going to keep enough Concord vines to supply us though.

If you want to enjoy your summer and fall apples, plant the best. There are few good apples of these seasons in our neighborhood, thanks to the tree agent, and maybe, to the vitality of the Russian apple.

I like the Yellow June and Red June apples. When I get varieties, with their quality, ripening in a succession from Whitney crab to the Grimes Golden, my smile won't come off, either. We have an old tree of the Grindstone variety, none are planted of late. I like them.

I like lemon pie, all right, and the things it stands for, but I believe we should patronize home industry, and when an Iowa apple tree, and a foreign prune tree bid to supply you in fruit, give the job to the Iowa apple tree to build up home orchards, instead of lemon groves down south.

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STRAWBERRIES, THEIR CULTURE AND MARKETING.

JOHN BOWERS, SIGOURNEY.

First select a well-drained piece of land, rich enough to raise a good crop of corn, a southeast slope preferred, or any piece you have. Plow in the fall of the year, the first of April disk and harrow, and a little later disk and harrow again, then it will be ready for planting—April planting preferred.

Distances apart to plant: 3 1-2 feet is a good distance to plant, eighteen inches in the row.

Varieties: Senator Dunlap is my choice. There are other good varieties, Sample, Glen Mary, Clyde, Warfield and others.

Cultivation: Once a week through the growing season, pull and hoe out all weeds and grass; if the vines get too long, cut them off.

In the fall of the year when winter sets in and the ground is frozen, give them a good covering of straw. In the spring rake the straw off the rows a little, and leave between the rows; it keeps the weeds down, and the berries clean.

Marketing: They should be marketed in new, clean boxes and crates free from straw and trash, and boxes well filled.

One or two crops is all that you can get from one planting.

F. O. HARRINGTON: The Senator Dunlap is the best strawberry for general planting. It is more sure to produce a crop than any other variety I have tried.

W. T. RICHEY: I would like to ask Mr. Snyder if he has ever tried the Santa Claus?

MR. SNYDER: Yes, we tried it several years ago, but it did not do as well as other sorts and we discarded it.

W. T. RICHEY: I never had a variety that produced so many berries as the Santa Claus.

J. L. WILSON: With whom did it originate?

W. T. RICHEY: Dr. Woodruff.

F. O. HARRINGTON: The berry is too soft to ship.

ELWOOD TATUM: I do not favor early planting; have had better success after the plants have started to grow.

J. M. TRIMBLE: Two years ago I set some plants and the ground froze soon afterward and three-fourths of the plants died. I had the same experience this year. I believe if the plants were set before growth starts they would not kill so easily.

F. O. HARRINGTON: Aside from danger from freezing; it is better to heal-in the plants and wait until you can put the soil in good condition for planting.

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REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Your committee on President's address would suggest in regard to the orchard heater that as it is as yet in its experimental stage, we would not recommend it for the average orchardist.

We would recommend the experimenting with nuts, and especially English walnuts of the hardier varieties, in the southern part of our district.

In the matter of co-operation would recommend that where it would justify, that such organization be formed, but do not think it practical in all parts of the district, and only where there are many engaged in fruit growing.

W. T. RICHEY,
MILLARD HARRINGTON,
ELWOOD TATUM,
Committee.

REPORT OF COMMITTEE ON RESOLUTIONS.

Your committee on Resolutions begs leave to submit the following report:

Resolved, that the Southeastern Iowa Horticultural Society returns its sincere thanks to the people of Keokuk county for the use of the Assembly Room in their beautiful new court house.

Resolved, that the Southeastern Iowa Horticultural Society learns with regret of the death of Dr. Bailey of West Branch, an old, honored and beloved member.

WM. LANGHAM,
ELWOOD TATUM,
ABNER BRONSON,
Committee.

REPORT OF COMMITTEE ON OFFICERS AND PLACE OF MEETING.

Place of meeting, Cedar Rapids; time to be determined later by Board of Directors.

OFFICERS.

President—C. E. Deuel, Washington.
Vice-President—A. J. Baumhoefner, Cedar Rapids.
Secretary—W. T. Richey, Albia.
Treasurer—F. O. Harrington, Williamsburg.

BOARD OF DIRECTORS.

First District—Roland Sherburne, Lone Tree.
Second District—Wm. Langham, Cedar Rapids.
Third District—A. Branson, Oskaloosa.

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Fourth District—Wendell P. Williams, Danville.
Fifth District—John L. Wilson, Centerville.
We also recommend a three days' meeting next year.

W. T. RICHEY,
A. J. BAUMHOEFNER,
S. B. DEWEY,
Committee.

GRAFTING FOR THE AMATEUR.

F. O. HARRINGTON, WILLIAMSBURG.

The art of grafting is one of the oldest methods known of increasing individual species and varieties of plant life not true to type through seeds and still at this late day in the world's history there are comparatively but few persons, and even among those who cultivate fruits, who understand enough about it to successfully practice any of the various forms of graftage. This ought not to be the case, and it is with the hope that I can incite some one to interest themselves in this particular feature of horticulture, that I am penning this study of the subject, and I am willing to promise that if they will take up the subject and study its phases, and practice on Dame Nature's own children in plant life, they will find it intensely interesting, and ofttimes very satisfactory in other respects.

Some way in the depths of my inner consciousness I firmly believe that there is a purifying, refining influence on the moral nature of every son and daughter of Eve who loves plant life. Now this is not the particular reason for which I am appealing to you, but this phase of it will not harm in the least, whether you need it or not. You have all heard of the boy who said he was in the habit of taking one good, thorough wash each summer whether he needed it or not, and it did not hurt him.

In this question of graftage, I cannot, in the scope of a paper like this, go very deeply into detail, but must pass hurriedly and briefly over much that is of both interest and importance, but after I have read my paper, it is arranged that I shall continue this subject in the form of a lesson in which I shall attempt to show you some of the ways, also results of graftage, and you will be at liberty to ask any question you will on the subject.

The general uses of grafting might be named under three general heads: First, to perpetuate a variety; second, to multiply such variety rapidly; third, to make some desired change in scion or stock, sometimes quite radical in its nature.

Nearly all of the named varieties of fruit trees, most ornamental trees and shrubs, are perpetuated by means of some form of graftage, and with some this is the only possible method of perpetuation.

The second reason for graftage is clearly exemplified by the nurseryman's system of rapid propagation in nursery by the various forms of graftage.

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In the third division you will recognize the dwarfing of the pear by grafting it upon the quince stock, or the apple upon the paradise stock, or of the putting upon stocks several feet in height, the tops of various forms or varieties of weeping trees, that in themselves never form upright stems or bodies.

We may also, for convenience, make three general divisions in the system of propagation by grafting. First, bud grafting, or budding, in which, by whatever way it is practised, only a single bud is used, and is inserted upon the surface of the wood of the stock.

Second. Scion grafting, or grafting proper, in which a short cutting usually with two to four buds, is inserted into or upon the stock. Inarching, or grafting by approach. In this form of work the scion remains attached to the parent plant or tree until after it has united, and is but little used at the present day, as compared with the other methods, as much of the work that was formerly done by this method, is now performed by the use of the veneer graft.

Commercially considered, budding is the most important class, for it is so largely employed in nursery propagation upon nearly all fruit trees, and on the stone fruits almost exclusively. The roses, and very many of the ornamentals are grown from buds. More generally this operation is performed in late summer or early fall, because at this time matured buds of the new growth are readily available, and the young stocks are large enough to work readily, but most kinds of budding could be as well done in the spring when the bark begins to loosen with the initial growth of the season, and using dormant wood buds, except for two reasons,—first, that the time is more limited for available working, and also so imperatively demanded for so many other things then, and, secondly, that the buds of dormant wood are not so readily handled for insertion, having no stem attachment. What is commonly called the shield bud is the one in general use in this country. If for early budding, it is cut from the dormant wood of last year's growth. If used later in the season, it is from the present year's growth, using the buds the most fully developed.

The bud so-called, consists of a single eye or bud, and with it is severed from the cutting about an inch in length of the bark, and usually a slight amount of soft wood tissue beneath the bark. This is inserted beneath the bark of a young stock, or a branch, and then tied to hold the cleft bark securely about the bud until it shall have united. With nursery stock the bud is usually inserted a couple of inches above the surface of the ground, and preferably on the north side, to shield it from the drying influence of the sun. In using green wood for buds, the leaves are cut away, but leaving about 1-4 to 1-3 inch of the stem of each leaf, and this serves as a handle in placing the bud.

In preparing the stock to receive the bud, two incisions are made, one vertical, and one transverse. The vertical about on inch and a half long, and the other made across the top of the vertical cut with a rocking motion, and neither only deep enough to cut through the bark. The corners of the bark thus formed must be lifted a little with the knife, so that the bud may be pushed down into place, unless the bark slips very

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freely it will have to be loosened along its cut edges downward and the bud is then pushed down under the cleft bark, and the entire slip should pass into the cleft. In case a little of it does project above the transverse cut, it must be cut away, so that all of the cut under surface of the bud lies firmly upon the cambium layer. The bud should always be tied, any soft cord can be used. No. 14 or 16 knitting cotton can always be found, and is very satisfactory. Raffia and bass matting are also used. The string is started to wind at bottom of cut, the loose end being held by lapping the second course over it, and the upper end is secured by drawing a bow through under the upper course, or, as I generally do, make a downward sloping cut in the side of the stock an inch above the bud, but around to one side or back, and pull upper end of the string down into the cut so that it wedges tightly. Care should always be taken not to draw down the string across and upon the point of the growth bud, both below and above this bud the string should firmly bind down all the cut surfaces, but no wax is used. In ten days, sometimes sooner, sometimes later, owing to the condition of the stock, and weather influences, the string will begin to tighten enough to cord into the bark because of the growth of the stock, and if left too long may cause the death of the bud by constriction, therefore should be cut whenever they begin to show this constriction.

A knife may be drawn over the strings on the opposite side from the bud, cutting through enough of them so that the strings will cause no further trouble. The following spring, the stock is cut off just a little above the bud, so that the force of the plant will be used in the development of this one bud.

Budding is sometimes used in the same manner as top grafting for changing over a tree top from one variety to another. Old and stiff bark will not work well, but smooth fresh bark will be all right. Old trees might be severely pruned one season and have a good supply of young shoots to bud upon the next season.

A method of budding that is known under the general name of flute budding is often used in late spring for plants, or trees with thick heavy bark, such as the hickories, walnut, pecan, &c. In this form the bud is not covered by the bark of the tree, as in shield budding, but a portion of bark is removed entirely from the stock, and a similar piece is fitted in. When the section of bark removed and replaced with another extends only part way around the stem, it is sometimes called veneer budding; on the other hand, if it extends entirely around the stem, it is sometimes called ring or annular budding. In whatever form used it is tied and afterwards treated in the same way as in shield budding, except that sometimes it is coated thinly with some form of liquid wax to prevent too great evaporation while making connections.

Grafting is spoken of with reference to the position in which it is applied, and with regard to the form in which scion and stock are put together. It is called root grafting when the stock is wholly a root, or piece of one; crown grafting when scion is placed in the crown or collar of the tree stem, or plant, at surface of the soil; stem grafting, when applied to stem of the tree, and top working if applied to the branches.

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The forms of grafting in most common use in this country, are the whip graft, sometimes called tongue grafting, cleft grafting, and veneer grafting, though there are several others in more or less use, and for particular lines of work. Whip grafting is used only on small stock, both parts are cut across diagonally, leaving a face cutting of from one to two inches of length, depending on the size of the graft. A little cleft is made in each, thus forming a little tongue. Each tongue is then in joining the parts shoved into the cleft of the other, and with light winding with light twine soaked in wax, leaves the whole almost as rigid as an uncut slip. This is the nurseryman's method of winter grafting of small fruit stocks. The stocks having been dug in the fall and stored until needed. Quite largely only small pieces of root are used with each scion, but some prefer to use the whole root, so termed, grafting at the crown only. These grafts are packed away in sand, or moss, or sawdust, in a cool cellar until spring, and then planted out in nursery. There has in the past been much discussion as to whether the piece root graft of the apple was better than the whole root, and vice versa.

I believe it largely a question of locality, or more properly speaking, of climatic conditions. In our locality with its climatic extremes, I believe the root graft the safer to plant. If all grafts or buds could be put on strictly hardy seedlings, say like those of Duchess or of Virginia Crab, I would quite as soon have the budded tree, or crown grafted, even though the seedling came up to the top of the ground in the orchard, because of the inherent hardiness of such stock, but the French crab or the seed from the pomace of the eastern cider mill, are neither of them hardy stock, and are subject to winter killing beneath the trees, ere their days of usefulness have fairly begun, and especially so if the seedling stock reaches to the surface. Were I planting in the Ozark regions, I would prefer the budded trees, because they have, or should have, a more abundant root system, and thus may grow faster at first.

Cleft grafting is used on larger stocks than the whip graft method. The stock is cut off squarely and split and a scion with the lower end cut into a wedge shape, is forced into the cleft. If the stock is large enough to put in two scions, I usually do so, because if both grow they hasten the healing of the stub, and there is also a greater certainty of having at the least one shoot growing. The scions thus used generally have two to four buds. The outer edge of the wedge should be slightly thicker than the inside, so that it will be held firmly at the point where the union first takes place at the meeting of the cambium layers of the two parts. At the division between bark and wood is the point where scion and stock should meet, and the scions are usually set slightly oblique with tops turned outward to insure contact at some place of the cambium layers. The wound must now be waxed to protect the wound completely with an airtight covering.

Veneer grafting is quite largely used for ornamental and rare stocks that are grown in pots. A downward cut is made upon the stock just through the bark and downward perhaps an inch, the piece of bark thus separated from the stem being removed by a downward sloping cut to the

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uncut portion of the stem, the lower end of the scion is cut off obliquely and on the long side a portion of bark is cut away to correspond as nearly as may be to that taken from the stock. The scion is then put in place and tied tightly to the stock. This system is not used in out door work much. Rhodendrons, Japanese maples, and several of the fancy and scarce evergreens, &c., are propagated in this way. Stocks which were grown out of doors are placed in pots in the early autumn and placed in a cool house, or a pit, for some time. The scion is attached about an inch above the ground in the pots, and the stocks are not cut back until the scion has united. Both dormant and growing scions are used. If the growing scions are used, the grafted plants are placed in a cold frame in which they can be almost covered up with sphagnum moss well moistened, and kept cool and damp until scions are well united.

Herbaceous Grafting. All such plants as geraniums, begonias, coleus, chrysanthemums, and many others, can be readily grafted. Almost any style can be used, but the veneer, cleft and saddle grafts are best. The union should be bound tight with whatever tying material is used, and the plant set in a propagating frame, where it must be kept close for a few days. No wax is used. Many soft plants seem to suffer damage from the use of wax.

Of all lines of graftage, the one of most interest and benefit to the ordinary orchardist is that of top working, the changing over the heads of some variety that you have and do not want, into some variety that will be profitable, or at least be satisfactory to the owner. I have many times been asked whether it would pay to top work apple trees that were bearing, but were unsatisfactory. My answer is always, yes. I am a staunch advocate of top working where the orchardist, or farmer, has trees that are not productive, or being productive, have comparatively worthless fruit. If they are bringing in no returns, nothing can be lost if they are grafted save a little labor, and if the trees are strong and healthy there is no reason why much should not be gained. During the past twelve to fifteen years, I have been topworking over a considerable number of bearing trees, some of them of considerable size and in bearing several years, but some were large enough but persistently refused to bear. These trees after top working are proving profitable. Of course, in some of my top working, I have put in new varieties as well as some old ones for trial, and these may or may not prove satisfactory here, not because they are top worked, but because in the nature of things not all varieties will prove of value under new environments of climate and soil, and to begin with there is an almost endless list of the various fruits that should never have been propagated or named. My practice in top working trees whether large or small is to select such limbs for the grafts, and enough of them as shall in the future form full balanced head. To do this you will usually cut away from one-third to one-half of the actual top, the rest being left for the time being to preserve measurably the balance with the root system to keep the tree vigorous. In mid-season of growth the tree should be gone over and where a growing graft shows that it is being overshadowed by some of the other original growth of the top, the pruning knife should be

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used to partially head back such growth and an occasional interfering limb should be cut, but no other pruning is needed until the following spring.

At this time the trees should be carefully refilled with grafts where others may have missed, and occasionally perhaps, graft some new ones that may better fill out the new top, for it is good policy to put in plenty, even if in a few years some of them may need to be cut out. The yearling grafts, if strong, should most of them be headed back to ten or twelve inches in length, mainly to cause branching out, so as not to make long naked limbs. Now prune away in part, and perhaps in part head back such growth as in your judgment might during the season interfere with the light and room and possible growth of the new variety, and also cut out clean here and there a limb which was not grafted and will not be needed, but do not overdo this and cut out too much of the top, for the tree must have a reasonable amount of top. When another year ushers in the spring months again, go over these grafted trees, and if the new variety has made good growth, you may cut out all large limbs not grafted, but even yet it is well not to clean out all of the twiggy growth through the center and larger limbs, thus still retaining a fair amount of wood growth for leaf production. In top working a small tree, the grafts may be inserted on the limbs from ten to twenty inches from the center of the tree, but on a tree that is large enough to commence bearing, the limbs should be cut for grafting two to three feet from centers, and still more on larger trees. The larger the tree, the more scions are needed. On a tree of, say, two years' growth in the orchard, the only grafts needed would be a central leader and four to five lateral limbs, and a new head will soon be formed and they can be changed completely over to the new variety after the second year. Contrary to the usual advice of the authorities, if I am setting out nursery trees into orchard with the intention to regraft them with some other variety, I do this grafting the spring I set them out. Set them in good season, then wait until the buds are starting, which of course will be a little slow on the newly planted tree, then graft. My theory is that a newly set tree should have about half of its top removed anyway, and one can top work and not prune more than that. The grafts do not make very strong growth, and very little pruning is needed the next spring, but there is thereafter no set back to the young tree as there must be when grafted at from one to three years after setting, as is so often recommended.

Another phase of grafting at setting did not work so well, that of cutting off the entire top at about eighteen inches above the ground, and cleft grafting the stem. The result some seasons was a number of dead trees, undoubtedly through stagnation of the sap and subsequent fermentation and death as a result. A remedy for this I found to be hung up in the nursery some trees that had one or two shoots along the stem below, and these could grow enough leaf to take care of the sap until enough of the graft top could be grown for the needs of the tree and side shoots be removed.

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The best time to do the top grafting of the apple is just as the tree is beginning growth, but any time for a month prior to this will do, and also for several weeks later. I have had very good success grafting the apple as late even as the 18th to 20th of June, but this requires scion wood that has been kept perfectly dormant, and in our cold climate it is much safer to have the scion wood cut in November or early December than later. My paper is too long to give you in detail my method of keeping scions in a graft box in which I can keep over scion wood in apparently perfect condition until the second year and even longer.

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THIRTY-SIXTH ANNUAL MEETING

OF THE

SOUTHWESTERN IOWA HORTICULTURAL SOCIETY

HELD AT

Corning, Iowa, December 6, 7 and 8, 1910

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OFFICERS FOR 1911.

PRESIDENT.

M. J. WRAGG.....Des Moines

VICE-PRESIDENT.

D. B. MCCALLA.....Clarinda

SECRETARY.

GEO. H. VAN HOUTEN.....Lenox

TREASURER.

W. M. BOMBERGER.....Harlan

BOARD OF DIRECTORS.

First District—F. P. Spencer.....Randolph
Second District—D. E. Moffiett.....Corning
Third District—None elected.
Fourth District—C. H. Deur.....Missouri Valley
Fifth District—E. B. Gay.....Griswold
Sixth District—C. O. Garrett.....Adelphi

Woodbine, Iowa, was selected as next place of meeting, Dec. 5, 6, 7, 1911.

SPECIAL MENTION.

Annual membership is $1.00; life membership is $5.00. A report of about five hundred pages is given annually with each membership, express prepaid. A life membership in this society carries with it a life membership in the state society.

The board of officers are authorized to fix the date and place for the next annual meeting. Notice and programs will be sent in proper season.

Papers are requested for the next session, they should be sent to the secretary, or to any of the officers or directors.

Premiums for fruit exhibits will be offered, and all who can are asked to bring good fruit to the meeting. A good fruit show helps to make the meeting more interesting.

LIFE MEMBERS.

Alger, J. E.....Villisca
Barnhill, O. H.....Holt, Montana
Beach, Prof. S. A.....Ames
Bechtel, J. M.....Hamburg

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Bomberger, W. M.....Harlan
Bordner, W. E.....Onawa
Coppock, John A.....Griswold
Coleman, J. E.....Farragut
Darting, H. A.....Missouri Valley
Deur, C. H.....Missouri Valley
Everett, Leonard.....Council Bluffs
Fouts, W. A.....Payette, Idaho
Garland, L. E.....Afton
Gay, E. B.....Griswold
Garvin, J. P.....Mondamin
Giddings, E. T.....Missouri Valley
Gowens, G. W.....Missouri Valley
Goy, W. R.....Tabor
Greene, Wesley .....Davenport
Leggett, Frank B.....Council Bluffs
Lotspeich, D. W.....Woodbin
McBride, O. B.....Missouri Valley
McGarvin, J. S.....Missouri Valley
Murphy, J. W.....Glenwood
Rich, W. G.....Council Bluffs
Sieck, C. H. .....Manilla
Van Houten, George H.....Lenox
Waterman, F. G.....Fresno, Cal.
Williams, L. A.....Council Bluffs
Youngerman, Oscar.....Council Bluffs

HONORARY ANNUAL MEMBERS.

Mrs. H. M. Towner.....Corning
Mrs. A. J. Parker.....Corning
Mrs. O. P. Fredrick.....Corning
Mrs. T. B. Fisher.....Corning
Mrs. Sallie Wathall.....Corning
Mrs. Dr. Walahan.....Corning
Miss Stella Davis.....Corning
Miss Nell Belding.....Corning
Myra La Rue.....Corning
Idelle Diddile .....Corning
Mrs. Charles Gray.....Corning
Mrs. G. R. Bliss.....Corning

HONORARY LIFE MEMBERS.

Bonham, A. S.....Council Bluffs
Taylor, F. W.....Manila, Philippine Islands
Taylor, F. W.....Denver, Colo.
Terry, Mrs. H. A.....Crescent
Williams, L. O.....Lincoln, Neb.

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ANNUAL MEMBERS.

Dodge, N. P.....Council Bluffs
Field, Henry .....Shenandoah
Hess, J. P.....Council Bluffs
McCalla, D. B.....Clarinda
Moffett, D. E.....Corning
Morrison, W. L.....Chariton
Wragg, M. J.....Des Moines

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OF THE

SOUTHWESTERN IOWA HORTICULTURAL SOCIETY

HELD AT

Corning, Iowa, December 6, 7 and 8, 1910

Meeting opened by invocation by Rev. C. G. Marshall, of Corning.

A. Ray Maxwell, Secretary of Commercial Club of Corning, gave an address of welcome, which was not supplied for publication. He stated that he was glad to welcome an organization that endeavored to better farming conditions and increase the productiveness of the soil. Anything that will better any line of work in the country will help the producer and farmer and that in turn will help the town.

George H. Van Houten responded to address of welcome. He said in part: That the society was organized near Corning; four of us and the wives of three, Mr. A. F. Collman and wife, George H. Van Houten and wife, Mr. Wm. Taylor and wife, and Mr. M. S. Hubble. Through the many years of its history, the society has done good and effective work. I am one who took personal interest in the society when pioneer effort was necessary, and the hard work and unselfish efforts of the early pioneers of this vicinity have accomplished much.

The society was organized on a farm near this city. It was called the West Iowa Horticultural Society, and later the name was changed to the Southwestern Iowa Horticultural Society. It met on farms at first, and was a considerable factor in introducing varieties and stimulating interest and practical methods of culture on farms and in commercial orchards in this territory. Mr. Williams of Glenwood and Mr. Russell were later very strong and useful members. I was secretary during all these early years of the society, and guaranteed its expenses personally during its early life, until we got financial help from the state society.

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Committee appointed on fruit awards: C. H. Deur, G. R. Bliss, E. B. Gay.

On president's address: M. J. Wragg, W. R. Goy, D. B. McCalla.

The following reports were given by directors:

First District.

F. P. SPENCER: Have to report on apples almost a complete failure, the most so of any year in my recollection, there being very few raised in the extreme southern part of the district, which proved to be just along the border of frost damage, orchards five miles south in Missouri having full crops.

Peaches, same as apples only more so.

Cherries, possibly 15 per cent crop, about enough for the birds.

In fact, a good, big, lusty cipher would fairly represent the above fruits.

Grapes, about 40 per cent; plums, 10 per cent; raspberries, none; blackberries, too dry; strawberries, 40 per cent.

Second district.

GEORGE H. VAN HOUTEN: I have no report, think best not to give any. Conditions have been such, we cannot make a report in our district.

Fifth District.

E. B. GAY: Our district is nearly in same condition. I can say this; there was about one-sixth crop of grapes, one-quarter crop of strawberries.

Sixth District.

M. J. WRAGG: Winter apples were nearly a total failure, and yet it was a matter of surprise what could be gathered up for the fair and show purposes in more favored spots. There were a few summer and fall apples.

There was 30 per cent of a grape crop around Des Moines.

Strawberries nealy a failure. I had a plot that was somewhat neglected, and it gave a good yield. There were quite a lot of plums along the west bank of river; on east sheltered slopes Americanas fruited well, and so good there was partial crop; there were also some European and Japanese plums, but not much over 30 per cent of a crop.

Currants and gooseberries almost entire failure.

J. M. BECHTEL: I lost 1200 peach trees, the tops went off clear to ground; 600 killed outright, but the other 600 sprouting up.

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E. B. GAY: I lost a good many Janet trees, but there was nearly a full crop of Janets this year with me.

D. E. MOFFETT: Our Janets were hurt but fruited. I had a Jonathan tree that was split and parts of tree lying on the ground, and these sections were connected with parent trunk, and they bore full and well.

I had a limited area of strawberries we covered at critical times with carpets and saved them and got a wonderful yield from the small area.

W. M. BOMBERGER: I am surprised at Janet going out when young. It is our hardiest winter apple of the old list in western Iowa.

C. H. DEUR: I think the cause was the unseasonable freeze the year before, on October 12. I lost several hundred trees, including Ben Davis.

M. J. WRAGG: We all have our theories. That was a severe freeze, and did much damage to shrubbery and roses and tender growth, induced by late fall rains. But there was further damage in the spring, 1910, after foliage was all out and growths started by freezing that killed all this early growth. To destroy the new growth at that stage is a severe shock, and very injurious to trees and plants. We had many Mahalebs that were cut to the ground, thousands of them were a complete loss.

E. B. GAY: Severe winter weather killed blackberries, raspberries, roses and tender shrubs, and did considerable damage to apple trees, especially on low, wet ground. March was most favorable for fruits and prospect was never better for full crop of tree fruits and grapes, but the freeze of last few days in April cleaned up everything but a few strawberries and some grapes that came on after the freeze.

THE LAWN.

S. L. MORRISON, CHARITON.

Much could be said along the line of this topic. The first is how and where to begin. What to plant, how to select and care for the same.

First, be conservative as a successful financier would be. Don't be to hasty, weigh the proposition well before venturing out to sea, lest you miss the goal of your ambition.

And when this is done we are ready to begin with the work, making sure the proper grade is had, as this is very important. The matter of

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drainage should not be overlooked, and if not naturally so drained the soil should be sub-soiled or tiled. If this is not properly done unsatisfactory results will surely follow.

No successful farmer or fruit grower would expect satisfactory returns from time and means expended if he should overlook this very important matter of drainage, and the day for the shipshod farmer in Iowa, will soon be a thing of the past.

We have now gotten our ground ready, and will proceed—well, how about a landscape gardener service. I will here venture (in confidence) the assertion that in many instances he is the one who prescribes and the man that purchases the goods. The tree peddler or the nurseryman, or whoever he may be receives a handsome rake off.

We don't mean to infer that all in this profession do it this way, far from it, but a little hint serves a good purpose often. Travel is cheap these days and if we look around a little, and be free to ask questions concerning the things pertaining to the lawn, you would be surprised to find what a storehouse of knowledge you would be able to carry home.

I have in mind a lady friend who lived in the city in a fine mansion, she admired a plant growing in a neighbor's lawn, and being very modest she would not venture to inquire the name. I have observed in my travels from the Magnolia tree of the South, to the Great Garden of the North, and from the Rockies to the Atlantic Coast, that there is a gradual growing tendency to plant fewer trees in the lawns of late than in former years.

There is more care being taken to avoid novelties, leaving this part of the work for the nation and state to deal with, and are confining their planting almost exclusively to such kinds as are known to be the best to their several localities.

How a lawn can be made the means of making the home happy, and the scenes of early childhood as lasting as time on the mind of the occupants of that home.

I will illustrate from experience; being a Methodist this would be permissible. In the home of my childhood we had a lawn and as father and mother were lovers of fruit and flowers, they set apart a little plat of ground, a few feet square, for each of the seven children, and each took great pride in the little flower plants, watching their growth and development with zealous care from year to year.

This schooling brought us into close touch with nature and with the home.

The mothers did the supervising of our work which some very little hands were engaged in. This lesson was never forgotten, it will endear the child to the home—Teaching industry—and the impressions made on the minds of the children will never grow dim with the lapse of time.

By all means make the home attractive; interest your children in the home, and the day will come when the children will grow to manhood and womanhood, and raise and join in the charms of blessed be the tie that binds into our parents and our childhood home.

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THE TREES.

J. E. COLEMAN, FARRAGUT.

The homes without trees are few and far between, in fact there are but few places in the State that have no trees. The city or farm home that is treeless is very barren and has a cold look about it.

Many dollars can be added to a place by a few well kept trees, it is a good way to increase the value of property, as well as to add comfort to the home. As to the kind of trees I believe I am safe in saying that the day is past for the planting of cottonwood, boxelder, soft maple, willow and all cheap quick growing trees. It may do to plant a few boxelders or cottonwoods for quick shade, but cut them down before they spoil the permanent trees. As to the kind of trees, if you want a wind break for the barnyards plant evergreens, as land is too valuable to plant deciduous trees, then when you have a wind break you will have one of value. Most farmers have too many trees, and they are planted too close together. Better have fewer trees and give them better care.

As to the varieties, I would have elm, ash, white birch, sugar maple and evergreens. Many people seem to overlook the ash; it is a beautiful and hardy tree that will stand lots of neglect. its dark green leaves look so rich and beautiful. It stands pruning and can be made one of our most valuable trees. As a rule the trunk is always straight and uniform. Don't be afraid of the ash trees, for time has proven that they are worthy of a place. Plant one or two near the hitching rack to shade the horses. The ash will stand lots of tramping, and still look green and rich. Just look at an ash and boxelder at the same time. The ash is as far ahead of the boxelder as silk is ahead of calico.

The well will need shading and the boy will want a shady place to work in summer. Plant an elm, as it will in many years to come call forth many words of praise for you. It will be fine for the women to wash under in summer time.

The sugar maple is a tree that always looks good to me, as they seem to improve with age. I have nine in my lawn that cost fifty cents each, or $4.50. Today $100.00 would not buy them. They are not for sale. Let a few sugar trees be planted, and you will always be proud of them, as they look fine and are a valuable tree.

A white birch or two on the lawn looks well. They are worthy of a place, but it is not a tree that will stand neglect.

A couple of rows of walnut trees would be good and profitable, and the walnuts will be valuable.

Plant your trees where you want them, and be careful not to plant them too thick. Don't make the old fashioned mistake of planting them in rows. Select trees that have good, straight trunks and evenly balanced, and give good cultivation for a few years, and I am sure that the time and money will be well spent.

In selecting and planting trees remember that you are making permanent improvement. Give it thought and consideration, for it is well worthy of careful study.

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NOTES ON PACIFIC COAST HORTICULTURE.

G. H. VAN HOUTEN, LENOX.

Not having had an opportunity to consult with the secretary, in regard to the line of thought to be presented, it is with reluctance that anything is presented. Not that there is little to be said, but the reverse is true, for it has been with great interest and pleasure that I have had contact and observation from tropical Mexico to beyond the shores of the Pacific ocean on the north, saying nothing about the other side of the Pacific, much of which I have investigated, so the subject is entirely too large for the limits of one paper or even for one volume. Perhaps, however, it was not intended that the subject should embrace so much, and, while as a matter of interest, it might be pleasant to consider the subject from its broadest aspect, it seems to me that it were better to confine this article to that part of the Pacific of more immediate interest to us; that is that part relating to our own coast, and even this, if treated in its broadest sense, would require more time and space than could be given it. A further handicap is the fact that before this subject was assigned to me, or at least before having knowledge of it a similar subject was assigned to me for the state society and had written a paper for that society, and, not having the paper at hand for examination, and, remembering but little as to its contents, cannot feel as free to write as though such conditions did not confront; but from desire to comply with demands made on me and to serve in any capacity, will present some thoughts on the subject and leave the secretary of this and the state society free to put one or both papers in the waste basket.*

Most people know that in southern California oranges, lemons, figs and many other sub-tropical fruits grow and thrive wonderfully, but the fact that oranges are grown many hundreds of miles north in California is not generally known; so that it is hard to tell where the limit of such fruits will ultimately be, besides the comparatively tender fruits of the east coast of Asia are finding a congenial home in the west, and some of them are being extended to our northern borders, not counting Alaska, and yet, as some of you will remember, the writer has given some surprising accounts of Alaska conditions not generally known. This is not said as a re-capitulation of any former article or talk, but merely thrown in to suggest the difficulties of treating the subject assigned in any manner satisfactory to myself or others, not only because of the magnitude of the subject, the great amount of area included in the caption, but more, if possible, because of the great variety of things that can be produced and the great diversity of those productions, for the fruits and nuts of several continents are being introduced and the new creations, if such an expression is permissible, that are constantly being introduced.

Long after my first visits to the west, some of the lands now in fruits and bringing thousands of dollars per acre, were selling at a dollar

*The paper on "Horticulture in the Northwest" read before the State Society was taken from the desk by accident or otherwise and has not yet been recovered.—Secretary.

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an acre or less, while large areas then that could have been bought for a few dollars per acre are now producing crops that are bringing as high as one to two thousand dollars per acre, per year, while large areas are now being prepared for planting and the energy and enthusiasm almost contagious, and those who visit the country are liable to become enthusiasts and remain to engage in the business. Of course, the high prices ruling in the west is an incentive and the question is often asked, will high prices continue? When the conditions there are considered the conclusion is reached that prices will remain good, for there is the vast Puget Sound trade, with low shipping rates, not only for the distribution between local points, but low rates to Alaska, the islands of the sea and to Asia. Several interests of the west, on which the future of horticulture must depend, especially as to prices, are on the increase and are liable to continue to increase for many years to come. For illustration, the fishing interests are rapidly increasing, stimulated in part by the high price of meat animals and the general up-trend of prices; then the lumbering interests of the west are immense and will last for years at advancing prices if not advancing profits to those engaged in the business; gold and other mineral productions of Alaska are rapidly increasing and are liable to continue for a long time, while the increase of business generally and the population of the country surrounding the Pacific ocean will astonish the world. The Pacific ocean trade is increasing at such a rate as to give color to the claim of the captains of industry that the Pacific countries—that is the countries bordering the Pacific and the ocean itself, are to show the greatest increases in business and development, and this will inure to the benefit of the horticulturist, for the great inland sea, called Puget Sound, enables the fruit grower to ship thousands of miles at a cost less than the inland grower can ship hundreds of miles or even shorter distances, while the great west has not and is not likely to soon learn economy in buying, so it is safe to assume that low prices as known in the interior of the country whenever a large crop is grown are not likely to prevail in the Pacific countries. Again, while development there seems fairly rapid, yet it is not as rapid in increases as are other industries, for the reason that it takes time and money there to prepare lands for planting, and also there, as elsewhere, other industries, especially those near the cities, can hire help easier and keep their help better than ranchers and horticulturists, for, as on the farms of the middle west, (as we may call the country between the two great rivers,) it is not a good field for organized labor, and many laborers will not work unless they can be in or near towns, so that for a long time to come the great need of the west will be reliable help, but in spite of this great draw-back, horticulture is advancing rapidly and many have made fortunes in a few years in planning and growing, while a still larger number have made large profits in promotion work, for large areas have been planted by enterprising firms and sold to settlers who have done well, but the sellers have often had the advantage of making frequent turns, thus piling up numerous profits. Very little, if any, of the territory assigned to me, so far as the state of Washington is concerned, has to do with ir-

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rigation, for west of the Cascade mountains have an abundance of rain, while south of Puget Sound, and especially south of the Columbia river, irrigation is often applied and in some places necessary to success, while still further south, and especially in California, is of prime importance, for satisfactory results cannot be had without irrigation. It is not the purpose to discuss irrigation in this article, for such a discussion would require too much time and space, and, besides would not be of especial value to Iowa horticulturists.

One noticeable feature of Pacific coast horticulture is the absence of winter-killing of trees or plants, and another nearly related condition is the lack of killing frosts during the blooming season, or, perhaps, more properly speaking, the lack of frosts that kill the bloom of trees and plants, for it seems to be a fact that crops are seldom prevented by cold or frosts and the abundance of yield, as well as the size of the specimens of fruit is beyond that obtainable in Iowa, but when it comes to the question of quality, there is room for argument, for they have been unable to convince me that the varieties that do best in Iowa produce specimens as good in quality as we grow here, and yet it may be said on the other hand, that many varieties that utterly fail in Iowa produce abundantly and of good quality there. In apples this can be illustrated by stating that the King of Tompkins and the Baldwin not only produce well but fruit of good quality, while such varieties as Northern Spy and Gravenstein bear well and good in quality, while the Spy bears there much earlier than here. The remarks made as to lack of quality of apples do not apply to some other fruits, especially to cherries, pears, plums and small fruits, for all such not only bear abundantly, are of large size and fine appearance and of excellent quality. Not even tropical Mexico, with all its boast as to strawberries can excel the Puget Sound country in anything except a longer season of bearing, while the largest strawberries grown anywhere, so far as the writer knows, are produced in the Sound country. In the production of sweet cherries only Oregon and California can equal in size, and Oregon approach in quality, while it takes Palestine to equal the plums, prunes and pears as grown there, while nowhere else have such splendid small fruits been grown, or if grown anywhere it has not been the privilege of the writer to learn that fact.

When it comes to ease of planting it seems that nothing better could be required and probably nothing better will ever be found, while to very long season—lasting, continuously for half a year or even longer, leaves little or nothing to be desired, while conditions are such for six to eight months as to make the work easy and certain as to results. The length of the fruiting season and the enormous yield enables the owner of a village lot to have a variety and succession of fruit for half of the year fresh from his grounds, besides he can store keeping varieties, such as pears and apples to last the year 'round, while if too indolent to plant he can depend on a plentiful supply of wild berries in succession from May until December, so that country is nearly a paradise for a lazy man. I know for have tired of it, while the industrious man is sure of good returns for intelligent effort, for such a thing as a failure of crops, either

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fruits, vegetables or grain, is not taken into consideration, for it is said that such a thing as a failure has never occurred, and the several seasons that I have had observation justifies belief in such claims made for the Puget Sound region.

There are draw-backs, of course, but their problems are very different from ours. The lack of steady and efficient help has been mentioned, and yet believe this could be overcome if properly managed, for in that country, hired help is supposed to, as they say "eat and sleep itsself" and if a bunk-house is furnished that is all the horticulturist would be expected to do, but should he furnish a cook-stove and cheap dishes, cooking utensils, etc., it would be all expected or desired, unless he preferred to keep boarders, in which case a price would be set, the help paying board and working by the day, for in that country it seldom happens that one hires for as long a time as a month, although many laboring men remain in the employ longer. One of the great difficulties encountered there is lack of staying qualities or reliability on the part of hired men. Generally when Saturday night comes the saloon gets a large patronage and some do not return to work until their money is all gone, and as good wages are paid it often takes several days, even at the high prices prevailing for booze in the west, to take all the money and for the men to return to work. Incidently it might be mentioned that a great temperance wave has been sweeping over the west, not so much as a matter of sentiment as in Iowa, but more from the economic view-point. In recent elections there it is estimated that three-fourths have gone dry and as Washington, at the last election voted woman suffrage into the constitution it is safe to predict that the movement will continue until all saloons will be banished from that state, to the great advantage of all industries and particularly to the advantage of the horticulturist and rancher, for men who seek jobs contiguous to saloons will leave the state and a more dependable set of workmen will take their places, or else, unable to get their drinks in town, would be more willing to work in the orchard or on the ranch than they are now, for it is hard, indeed, to get men to work, except in large numbers or gangs unless in or contiguous to town or city. The word ranch as used in this article means something quite different from a farm as we know it in the central west, but there appears to be no good reason for believing that the ranching of the west, and especially of the Puget Sound country will not equal in profitable results ranching elsewhere or farming in the central west, but conditions there are so different that it will require some time for one going from here to get accustomed to surroundings and conditions.

Another draw-back in the west is insect pests, but there climatic conditions are such as to insure success with a minimum of work, for the work, except, possibly the first one or two sprayings, is done during the dry season, and as the wind seldom blows at this season, the work can be easily and satisfactorily done. The codling moth is seldom seen west of the Cascade mountains, but plant lice and leaf-eating insects should be destroyed and spray methods seem to meet the requirements.

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Such troubles as winter-killing or tender varieties seem to be unknown, while trees grow vigorously and with such certainty that losses in planting are not expected and the long season, from fall until late spring, including the winter, enables the planter to choose his own time, for it is seldom that it is so cold in winter as to delay planting more than a day or two at a time, while stock could easily be kept above ground packed in moss or even straw or could be kept over winter merely heeled in, to be set when desired.

It is surprising to see so much fruit going to loss, with brisk demand and good prices. Part of this is due to lack of foresight in securing the proper packages and in securing help to handle the crop. The wasteful methods generally pursued there would bankrupt the horticulturist of the east or middle west, but the woeful wastes there seem to be taken as a matter of course and scarcely excite comment.

Very much more might be said of Pacific horticulture, but it seems to me best not to cumber our reports with too much, for the reason that except as a matter of general knowledge or interest, that but few are particularly interested, and the few who are so interested can, if they desire, be given the information outside of our meetings and, while glad to confer with those so interested, feel that the subject has been treated with as great length as its merits deserve at this time, and so, unless questioned for further information will assume that enough has been said at this time.

An illustrated lecture was given by Professor G. R. Bliss on the planting of home grounds and their beautification.

No copy received for publication.

On motion of J. P. Hess the following ladies, members of the Village Improvement Society of Corning, were made honorary members: Mrs. H. M. Towner, Mrs. A. J. Parker, Mrs. O. R. Frederick, Mrs. T. B. Fisher, Mrs. Sallie Walthall, Mrs. Dr. Walahan, Miss Stella Davis, Miss Nel Belding, Myra La Rue, Idelle Riddile, Mrs. Chas. Gray, Mrs. G. R. Bliss.

Hon. J. M. Bechtel was given a unanimous vote of thanks for his special efforts to supply a fruit exhibit at this session.

BULBOUS PLANTS.

Mr. J. V. Phander said they were the easiest kinds of plants to grow and they make the most effective show. Tulips, hyacinths, as well as narcissus, daffodils and crocus, are secured in fall from seed houses. Tulips are easiest to grow. They can be planted in a bed in the yard at once in fall; in early spring they are up and blooming in April before one almost thinks of cultivating the soil. But while they are nice in beds they can be grown in boxes

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or pots. Use any four inch box that will hold earth and set them in soil and cover the boxes with straw out doors or set them in a dark cool cellar where there is no furnace heat. After six weeks to two months the bulbs will be rooted and water can be given the boxes and they can be started to grow in the cellar in mid-winter, after starting them bring them in late winter into a warm room and supply water, in a short time they will be out in bloom in brightest colors. Narcissus and daffodils can be as easily grown as weeds. Boxes or pots of them can be brought from under mulch out doors or cellar in succession and a bright array of flowers had during the whole spring.

They can be grown in large sized window boxes or porch boxes, and have months in bloom in early spring before any outdoor bloom is on, and they are free from insects, not easily chilled by cold, and need only regular watering.

Much can be added by the use of lilies. They need fall planting, deep planting where water will not stand, and they are little sheltered. A common mistake is to plant them late in spring when they should be fall planted and covered with a mulch. In bedding plants, Cannas stand as a fine class, Gladioli that cover a wide range of color and time of bloom in many sections that will furnish blooms for nearly two months. Dahlies are a large and varied class now, and can be made to cover two and half months blooming season. But the bulb class is a large one and covers nearly the whole season in blooming, and if specialized on any home grounds can be made to make a place especially attractive and grounds interesting.

HENRY FIELD: Mr. Stevens speaks of bulbs as being one of best flowers. I must press this point, and am surprised that more do not use them on their grounds. Last year we plotted tulip and hyacinth beds about our seed buildings, and in early spring when there was no flowers there was a wealth of bloom so people would come from over the city and country to see them. Teachers bring schools to see the grounds. They are easy to grow, need only seasonable planting, and come up almost before cultivation is required. But there is a nice lot of summer bulbous plants, as Cannas, Gladioli, Dahlias, and they are all easy to grow and carry a wealth of bloom.

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VEGETABLE SECTION OF THE GARDEN.

HENRY FIELD: Everyone ought to have a garden, people are better off physically, mentally and morally if they do garden work. It is a splendid exercise to do garden work. This is so if one uses improved methods and tools. This is the drawback to not only use good seeds but improved methods and tools. No one should try to garden with the traditional rusty hoe, but get and use a good garden outfit of improved tools. There are a number of outfits that are good and reduce the slavishness of the work and made it light and a pleasure. You will find a wonderful difference in the work if you use improved and up-to-date tools. Most everyone has trouble getting boys or girls interested in the garden, give them good tools and see the difference in the results of their labor. Children like to fuss with tools and use wrenches on them, to adjust them and see how well they can do. They take pride in them and the work they do and ease with which it is possible to bring about results. Then hand work should be supplemented with horse power by use of long rows and light tools. Big stuff should all be put out in wide rows so as to be tended by horse, and hoeing confined to plants in the row.

A MEMBER: What about a good sweet corn?

HENRY FIELD: For standard crop White Mexican is the best early. Nothing better than Shoe-peg for late, but for general canning Stowell's Evergreen is still leader. These three kinds cover the seasons and are well known and widely used. But sweet corn has not been advanced in improvement as much as field corn that has had more attention from corn breeders.

W. M. BOMBERGER: Would you advise surface planting or listing to secure good corn crop?

HENRY FIELD: Listing gives best crop. This is so in dry sections and dry years especially. The deeper rooting is an advantage in listing and in furrow planting.

W. M. BOMBERGER: This year I tried both and listed sweet corn gave twice as good results and we got a good crop of White Mexican and Shoe-peg sweet corn from plantings made July 9th. I have found no two varieties sweet corn better for family use than these two.

About what to plant is personal and according to our inclinations, ideas and soils, markets and purposes. Gardens should be most entirely planted with known sorts and tested varieties, and

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that which is absolutely adapted to soil, climate and the grower's skill and wants—plant tried kinds of seeds, grains and vegetables. A few new things are all right but not to many. It is well for a gardener to do little specializing, and while it is well to have a full list of garden vegetables for the season through, if one likes some things better take little more pains, expand on that line, and excell in it. Following a few fads adds additional interest and zeal, several gardeners in a neighborhood pushing fads into little rivalry, is what brings out the growing of perfect products. One may push sweet corn, another tomatoes, others cabbage, others potatoes. In these standard vegetables there has been marked advance made. Quality, size, flavor, yield, improved in all of them, and other garden subjects.

We should not be too utilitarian but plant flowers and grow them for the pleasure and beauty they afford. No farmer, or homemaker should ignore the choicest things that nature can give us, if it takes time for profitable lines do not neglect that which inspires and enobles home associations. There are hardy blooming plants, hardy annuals, peonies, phloxes, columbine, hardy daisies, and a long list of plants that need only planting once, and some care, but not much, and then there is a long line of bulbous plants that can be grown easily, some hardy, some tender, and they produce wonderful results if just planted and given little care.

ASPARAGUS, RHUBARB, AND HORSE RADISH.

WESLEY GREENE, DAVENPORT.

ASPARAGUS: This delicious vegetable deserves more attention by Iowa home builders than it has received. It is not very particular as to the kind of soil, so it is dry, friable and rich. We do not use the word dry in the absolute sense that the soil should be "dust dry," but should be well drained so that water does not stand on it. In very dry, hard, poor soils the shoots are small and tough, and of little value for food. On deep rich friable soils the "shoots" are large, an inch or more in diameter, crisp and toothsome. If only a few plants are to be set on a city lot, it will pay to trench the soil two feet deep, working in a liberal quantity of well rotted manure with each spadeful of earth lifted in the trench. For field culture, we advise the use of a subsoil plow on heavy soils at least 18 inches deep, so as to thoroughly pulverize the ground to that depth. Plants for setting a bed are usually grown from seeds. These are sown in drills about an inch deep in rich ground in spring, as early as

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soil is in good condition to work, in April or May, as the seeds germinate slowly. Radishes are frequently sown in the drills to mark the rows for early cultivation. Thin the plants to six inches for strong stock. Some prefer to allow them to grow closer and reject the small plants. Year old plants are better than older stock.

When setting plants in the field, we open furrows six to eight inches deep, four feet asunder, plant about 18 inches apart in the row, covering the crown about two inches, filling the furrows gradually through the season.

During the first year the plants receive frequent cultivation to keep the soil moist and free from weeds. No shoots are cut the first year. The tops are cut off in spring and cultivation continued the same as first year. A few shoots may be taken this year, but no heavy cutting should be permitted until the next year. A good covering of manure is given to mulch the ground after last cultivation and no further attention given until the next spring, when the tops are cut and burned and the ground thoroughly cultivated. A good crop of shoots may be taken until the middle of June, when a covering of manure may be given. This treatment should be repeated each recurring season.

Varieties: Conover's Collossal, Columbian Mammoth White and Palmetto are standard sorts.

RHUBARB: Is a never failing source of pie and sauce material, that can be had either fresh or canned throughout the year.

Linnaeus is an early variety of mild and delicious flavor, with brilliant red colored stems. Victoria is later and more acid. It is the standard mid-season variety. Mammoth or Giant, under a number of names, is a large late sort.

Rhubarb does best in rich, moist soil. Plant in rows 4 or 5 feet apart, with plantts 3 to 4 feet apart in the row. The usual distance is 4 x 4 feet. Plants may be grown from seeds, but the usual supply comes from division of the crowns. The planting may be done in small patches by digging holes with a spade a foot or more in depth, putting some fine manure in the bottom of the hole, and covering it with five or six inches of soil, setting the plant so the crown is an inch or so below or near the surface.

In the field, furrows may be opened with a plow, going several times in the same furrow so as to make a deep wide trench, which is then filled with six or eight inches of manure. Earth is thrown over it, and then the plants are set in the trench. Cultivate well to keep the soil moist and in good condition, give a good top dressing of manure every year, mixing it well with the soil by thorough cultivation. Rhubarb is a gross feeder, and to get large succulent stalks it must have plenty of fertilizer. The patch will not be in good condition to produce a crop until the third year. A few stalks may be pulled the second year. All seed stems should be removed, for seed bearing is an exhausting process, and the energies of the plant should be directed toward stalk production. An acre in full bearing should produce from five to ten tons of stalks, worth from one-half to five cents per pound.

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The plant is thoroughly hardy, and needs no protection from extreme cold.

Rhubarb forces easily, and quite a trade has been developed within recent years. It succeeds best when grown in a dark place at a temperature of about 60 degrees. Only good strong roots should be used for forcing. When grown in the dark, stalks only are developed.

HORSERADISH: This vegetable has been in cultivation "since the mind of man runneth not to the contrary" for medicine or as a condiment.

Horseradish should not be planted on hard clay soil, but in friable loam. A good mixture with sand is not objectionable. Stock is obtained from cuttings of the root. Pieces a quarter to a half inch in thickness, and three to five inches in length, are used. The top is usually cut off at right angles to the root and the lower end obliquely, so there will be no mistake in setting them wrong end up. When planted horizontally, it would make no difference.

Horseradish may be planted as a second crop with radishes, lettuce, cabbages, beets or other crops that are removed before midsummer. They may be set with a dibble in the rows of other plants twelve to eighteen inches apart, rows three feet asunder. When the other crops are removed the horseradish will occupy the ground. It grows more rapidly in the cool weather of fall.

The roots may be dug or plowed out in the fall. The yield is from one to three tons per acre.

They may be stored in frost-proof cellars, but should be excluded from the air, or they will deteriorate rapidly by evaporation of the pungent acid sought as a condiment, or they may be grated, put in bottles, and placed on the market in that form.

FLOWER SECTION OF THE HOME GARDEN.

O. B. STEVENS, SHENANDOAH.

Mr. Chairman and Fellow-Workers: In developing the resources of nature; I will treat the subject assigned me, namely, "The Flower Section of the Garden," but briefly, yet I trust some good may result thereby.

During the past of more than thirty years, since coming among you in this favored part of Iowa, there has been great strides in all the departments under discussion yet there is still room for thought and need of encouragement to those around us. There are still those who feel that they do not have time or means to indulge freely in the culture of mere ornamental plants, till the time for such culture has well nigh slipped by. They are too old and established in their habits to enjoy such, as they might have done, and their children who might have been held with delight and contentment in a cheery home, have sped away to other fields of interest or lost much of the desire for home delights that once they longed after and, that in an economic point of view as well

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as social, would have been of great value to them. Well to the point of what can be done. There is many a nook that can be dug up in the fall and planted to tulips, daffodils, or hyacinths, then in the spring after their blooming is over, set geraniums or plant the seeds of some annual plant, and the rest of the season will be enlivened by them. Again the next spring the bulbous flowers will appear from the first planting and so continue for several years.

Once we planted a strip of about one foot wide on each side of the walk from the house to the front gate with tulips and the next summer planted the same with portulacca seed, the bloom from the latter was a delight till frost took them, and the seed which fell sprang up the next year after the tulips had bloomed so with but little labor expended at the right time, furnished us with flowers through the second year.

Around our barnyard there is a fence with Clematis paniculata set outside and the vines of this hardy perennial completely cover the fence with a mass of green foliage and clusters of white flowers, which none of the animals in the yard disturb. It is a perennial plant, yet there is no trouble from the seed furnishing weeds where it is not wanted. As for the time to take care of this part of the garden usually there are children who once enlisted in the interesting features of beauty, will do much of the work as pastime for them and if wisely directed will help in other matters enough better to repay all the efforts of the parents in keeping the flowers in order.

It is best not to attempt too much in the line of experiment at once but try a little of new varieties each year and thus by succeeding you will enjoy the efforts for further success.

I will say in regard to planting such bulbs as tulips, narcissus, hyacinths, and lilies, throw out the soil to a depth of at least six inches and then dig up the soil beneath deep and mellow, level it and cover with one inch of sand, then set the bulbs, top end up, pressing them into the sand enough to keep them in place, then cover with sand enough to hide them from view. The soil first removed may then be put back and after freezing a light litter of straw or leaves will be beneficial. The sand around the bulbs serves two purposes. First it makes a loose bed for the new bulbs to develop in and next it prevents the grub worms from eating the young tender bulbs thus establishing the bed for a number of years from one planting.

Those of my hearers who are familiar with flower gardens and their culture know all this and much more, and should there be any here who may not be familiar with them, they probably will forget some of the names I have given yet the principles of my theme may be helpful and I trust will encourage some in their toils and be a blessing to those needing it.

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WINDOW GARDENING.

CHAS. N. PAGE, DES MOINES.

A quarter of a century ago, flowers and ornamental plants were kept in almost all homes throughout the country, and at first thought it seems strange that they are not as popular now ,but there is a good reason for the change. It is not that there is less love of flowers, for there are more flower seeds sown, and more plants set out than ever before. The trade also in cut flowers is increasing yearly with wonderful strides, thus showing higher appreciation of the beauties of Nature. We must then look for some other cause, and it is readily found in the fact that, with the introduction and general use of illuminating gas in our homes, flower lovers have been obliged to give up the culture of plants. Gas has a very injurious effect on almost all kinds of plants, not only from the gas which escapes in the room, but the elements in the atmosphere on which the plant largely subsists are destroyed and the foliage turns yellow, so that handsome plants are practically unknown where gas is burned. There is nothing which escapes its evil effects, though Rubber Plants, English Ivy and Sanseveria, are better able to withstand it, than most of the flowering plants.

In the country towns where lamps are used for lighting, the culture of plants has never been discontinued ,and we are glad to notice that during the past few years in homes where electricity is used for light, handsome flower plants are again taking their proper place to brighten the windows and make home more cheerful. Where the lady of the house truly loves flowers, and is willing to give them proper care and attention she can always succeed in having healthy, well-shaped specimens, and an abundance of bloom. Her flowers are her children, and they are properly housed, fed, and shielded from disease, insects or anything which would injure them.

While probably the majority of plants are kept in flower pots or hanging baskets, still during recent years the use of window boxes, is becoming more prevalent, and if well arranged there is nothing which will add more to the attractiveness of the wondow garden. The wondow box contains a larger amount of soil, and therefore it conserves the moisture better, and there is less variation. An ordinary window box is made about 6 to 8 inches deep, the same width and of a length to fit the window. Two or three cleats should be placed under the box to hold it up from the window sill and thus prevent injury to the woodwork, and allow free circulation of air underneath the box. We would advise placing a layer of about an inch of charcoal and small pieces of brick or broken flower pots in the bottom for drainage, before filling in the dirt.

Many are now constructing their window boxes of galvanized iron, making them double, the inside box holding the soil and having several holes through the bottom into the outside cover, which catches any extra water. By having these holes of good size and filling them with a piece of sponge the water will be soaked up into the soil, again, as needed.

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Almost all kinds of plants will grow nicely in this kind of a window garden. Of course, Geraniums are the most popular, but Fuchsias, Begonias, Abutilons, Heliotrope, Lantana, Roses, etc., all do well. The common Snapdragon or Antirrhinum, is one of the hansomest plants for the window garden. It is easily grown, a splendid winter bloomer, producing flowers in constant succession. Petunias also bloom nicely and Ageratums, Browallia, and Nasturtiums give excellent results. Of course, you will want some vines in the window, and Cohoea Scandens makes one of the handsomest climbers for a rapid, tall grower. Manetta Vine, with its beautiful red flowers tipped with bright yellow, is always attractive, and Maurandias, Saxifragas, Vincas, German and English Ivies are excellent in their place. It is an easy matter to arrange an arch or trellis over such window box, and a wire hanging basket can be suspended from the center.

If you wish plants in the north window, we would advise trying ferns, Rubber Plants and Palms for foliage, and Dutch Bulbs, such as Hyacinths, Narcissus, Freesias, and Tulips, for producing flowers. During the past few years, outdoor window boxes and porch boxes are being largely used. These are especially noticeable along certain fashionable streets in philadelphia and New York city, and in many of the flats and downtown brick or stone buildings of Des Moines, the windows are beautiful with these boxes and the bright flowers and beautiful vines festooned from them add greatly to the appearance of the building. Such boxes are also used to good effect along the top of the railing on porches, or along the edge of the porch where there is no railing.

In some cases very artistic boxes are made of ornamental tile or covered with rustic work. Along some streets in this city, the neighbors have banded themselves together to improve the general appearance of the street, and on almost every house there is one or more outside window or porch boxes.

I have sometimes wondered that people who have ample front yards do not make better use of the space, by ornamental planting of the various flowering plants, where they have opportunity to cultivate and enjoy, when there are many thousands compelled to live on a small city lot, who are deprived of this privilege. The growing of flowers appeals to every lover of Nature, it gratifies our desire for beauty and enables us to feel that we can benefit others as well as ourselves by their culture. The growing of plants is healthful exercise, and recreative, and brings us into closer, more sympathetic touch with Nature. Let us then try to make the World more beautiful and better for our having lived in it, and add to the brightness of other lives as well as our own enjoyment.

PRESIDENT'S ADDRESS.

J. M. BECHTEL, HAMBURG.

This is the thirty-sixth time we have met together at our annual meeting as an association.

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Iowa has not been blessed with a bumper crop of fruit this year. The district covered by this association, no doubt grew eighty per cent of the entire crop of apples grown in Iowa, which probably were about six or seven per cent of a full crop, in fact high or rolling land had but few apples, while the Missouri River bottom land had some full crops. As a personal example of the high, I had about 650 bushels of apples this season, against about 2,000 bushels last year. Last winter was a severe one on fruit trees, particularly the peach. I, personally have cut down about 1,000 peach trees that the winter killed, and these were all trees that were purchased from various nurseries.

I had a block of one hundred three year old peach trees which were budded on home grown seedlings and lost but two of them. I believe we will get a hardier tree by growing our own seedlings and budding from our home grown wood.

For the last three years I have had the honor of being the President of this Association, and on account of the National Horticultural Congress, being held at Council Bluffs each year it has attracted the attention of the growers to such an extent that many have lost interest in our Association.

Something should be done to help make this society stronger and more interesting to the growers, or we will lose our old time prestige.

The question of protecting our fruit with heaters, is a very important one, and should be investigated carefully.

In my opinion there is no doubt but what we can protect our fruit against frosts, by using proper heaters under favorable weather conditions, but I am much in doubt whether it can be done with a fierce fifty mile wind blowing.

It, I think, has been conceded that it is almost utterly impossible to grow good, clean fruit without thorough spraying and every grower should prepare to spray at least three times, and then grow good commercial apples. We had no scab in our territory this season being very dry. We did have worms and always will have them when the trees have only a few apples.

Home grown apples sold from $1.50 to $4.50 per barrel, at Hamburg, owing to quality and pack.

To show this was an off year for Southwestern Iowa, I will give you some figures. In 1891 Hamburg shipped 34,615 barrels, Glenwood shipped 26,093 barrels, Clarinda shipped 10,911 barrels, Villisca shipped 9,650 barrels, Red Oak shipped 9,667 barrels, Corning shipped 6,483 barrels, and so on through the district. I doubt if the entire district shipped 2,000 barrels this season.

I see by late report it is estimated the United States grew 22,000,000 barrels this season, and that is the lightest crop grown in the past fifteen years. For the year 1909, the crop was 22,735,000 barrels, which was next lightest crop and the largest crop grown in the last fifteen years was in 1899, and was 58,466,000 barrels.

Our population has increased nearly, if not quite, 20,000,000 in the last fifteen years, while our production of apples has been steadily decreasing.

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It is claimed our population is nearly, if not quite 92,000,000 now. Our export of apples nearly 2,000,000 barrels. This will leave almost one bushel of apples to every family of five people for a year's supply. So you can readily see many must go without apples at our present production.

Farmers may say we have no market for what few or surplus we do grow.

The reply is, you do not grow enough to induce the big buyers to come to see you.

SECRETARY'S REPORT.

W. M. BOMBERGER, HARLAN.

Peculiar character of the season with its abnormal misplacement of time in season gives some new interest in a contest with natural conditions.

Anyone wishing climate this year could get anything he desired without going to California, Texas, Arizona or the regions of either the north or south pole.

Iowa summer in March and April, and Phoenix, Arizona, weather in July and August, with aridity that prevails in irrigated districts for nearly three months has not been productive of a record breaking apple crop in 1910.

Excepting grapes all markets in Iowa had to be supplied with shipped in fruits, and has been a market for other more fortunate territory. Such conditions following one of plenty in 1909 where there was prodigality of fruits with great waste and loss naturally brings up the questions of getting some value and use of the fruits that were culls, grades, summer rotting varieties, as Duchess, Wealthy, Whitney, and a long list of apples that yearly on farms are a total loss. Common evaporated fruits this season were from nine to fifteen cents, and fancy evaporated goods from twelve to twenty cents a pound. Probably never in history of the canning trade have canned goods sold so well and so high; canned apples shared the same prosperity. I have an apple grower report to me from Harrison County of having canned nearly 400 cases of early apples that gave him a net return of 50 cents a bushel, for the apples canned with an ordinary canning outfit, not expensive, of type that can be used by ordinary farm or home labor.

The enormous waste of fruits on farms last season, if it had been seasonably canned, could have been easily taken up this season when the general food values have been so high and in some lines nearly prohibitive.

The price for grade apple, evaporated stock, would have brought the price for apples that went down as grades and rotted or went as hog feed, around 65 cents a bushel. In many cases the home, farm and orchard labor could have put up this product. And while people agitate economic

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ideas in poultry raising to gather every egg, practice saving in judicious feeding and balancing rations in farm economics they should practice some of these economies in the fall, in full crop apple years, for utility and sale when orchards are in the off year.

Pure food laws since inauguration have placed a premium on home made butters and jellies. In parts of Canada, these products occupy a large place on some orchard grounds and in many localities local plants take up the fruit after the fashion of our corn canning plants scattered over western Iowa.

Second grades and culls are such a dead weight against the marketing of good fruit in fall that it is one of the most serious problems of marketing fruits to get rid of it, and these channels are ample to take them up and leave the open market for good well-graded fruits that can commence the season with a good price that can be steadily maintained. I am aware it is more easy to suggest and direct than to accomplish and do these things. It is also evident that self-interest will always push individual enterprise for personal gain. But a reasonable interest should be taken for the general advantage of everyone that will overshadow personal matters and raise the general level of benefits that will affect all alike and better all conditions.

First grade fruit needs no attention here other than urging it be grown and get it to the buyer as quickly as possible.

Three successional knockouts by May frosts of bloom in last six years has given interest to its prevention by use of smudge fires. Smudge firing has strong advocates as well as those who are not so firm in the faith. While it is not new, it is an old idea brought up to a more effective use as a possible factor and benefit by modern means and highly concentrated form of fuels. One thing that is rapidly being determined is how to accomplish results and do the work. Best authorities now admit there is not so much and in fact little in the value of heat produced by fire pots, as there is in making a smudge or canopy over the orchard and maintaining it there by a successive supply of smudges. This canopy retains the heat under it that is constantly given off by the earth under the canopy, preventing frost and frozen conditions. Whether to smudge or not to smudge we think is best for each to determine for himself, if crops justify it is well to make considerable experiment. As we view it, all can be privately and openly discussed in this meeting.

Transportation question is the third important item for consideration here. That the central west is discriminated against in railroad rates is a fact we must admit. Large and small orchard interests are affected in Iowa and discriminated against by low rates into our territory from other growing points and into territory rightly belonging to Iowa as an outlet. This has discouraged orcharding, caused many to abandon it,—pull up by roots their plantings. Iowa has good orchard soils and conditions and can equal and can grow apples better than many exploited mountain sections that are exploited by real estate dealers and railroads to get a long haul on settlers one way and a long haul on the apple crop the other way. Then after these western points get developed it turns out that the rail-

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roads get most of the crop in freight charges and as in the orange industry, such localities are held up and growers in Southern California and Florida often do not get first cost out of their crops even with shipping associations. Now these rates are made effective to local Iowa points, so that Iowa conditions are made to cause discouragement and loss, and the outside fruit is placed here at a low rate, keeping business of apple growing at a low ebb in the Mississippi Valley. They develop, advertise and exploit western sections, first start development, then squeeze the growers and pinch us here and the consumer at other end. Attempts to get rates to points in Dakotas, Nebraska, and West are made, but in vain, to get a decent rate. Classification of rates is made on Iowa apples with lemons, oranges, and such other higher class stuff of tropical luxuries.

There has been an upward march of land values over the West and in our territory as a society. Possibly values are beyond the paying point to own land with ordinary management. Ordinary management in farm and orchard properties should not be the aim or be a satisfactory working basis for any land owner now.

The first idea associated with land should be a home. Excessive speculation in realty has placed it too much in the category with speculative enterprises. Land is getting to be known too much as a speculation to be tossed between buyers and speculators to be kicked to a final goal of excessive profits.

Land should be a home. Long lists of lands at so much per acre should be much less a matter of barter and speculation. Land should not only be a home but be made the best place on earth to live. Not so much as a question of it being a paying property as being a desirable place to stay, to give the greatest pleasure to be enjoyed beneath one's own roof-tree. It should be made to pay—yes, but more, it should be made to contribute most to life, enjoyment, the neighborly social sphere of the owner, and have a far reaching influence in the higher enjoyment of the owner and be a basis for patriotism.

This society should throw its full influence and the weight of all its authority in building better Iowa homes. They need good surroundings, yards, trees, shrubbery, shelter, adornment, an orchard, vineyard, small fruits, vegetables and flower gardens, window gardens, conservatories, farm greenhouses; extended and widened work in landscaping and the general gardener's art.

The most important factor in such expansion of horticultural activity is the labor problem. More labor extensively applied at such realty values will be a necessity in the future. No such values can be retained in lands with meager incomes gotten by small outlay of human effort.

A neighbor of the Secretary made a trip around the world. He expended nearly a year of time in the thickly settled sections in Germany, Denmark, France, England, Italy, studying agricultural conditions. He, himself, is a cattle feeder, running 320 acres in the cattle feeding industry, farm all in grass, buys all grain, feeds and ships his stock to market. On a journey from north Italy to Rome he got acquanited with a young Italian and his wife who had 300 acres in a rich valley in Italy. He

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told them he had 320 in Iowa, and as they were educated in several languages and could talk with him, they asked the particulars about his methods and returns from lands and the labor and help problems. They asked how much labor he employed in Iowa on 320 acres, he told them he had one man, and they wanted to know what he paid his man. When told $25 per month, and that he kept a horse free for him, they were astonished and told him they employed 70 people both young and old the year through, and that $35 per month would hire 12 people on their estate. We are not putting enough labor on our orchards, farms and home properties and there is extensive loss and shrinkage in values yearly. But where get it? I am aware it is hard to get, but think that foreign labor should be extensively introduced in agricultural sections in Iowa. Congested countries would gladly give their population, and we advise extended use of the kind brought up and educated under conditions of intensive agricultural activity in Europe.

TREASURER'S REPORT.

J. P. HESS, COUNCIL BLUFFS.

RECEIPTS.

Balance	$ 71.26	
Memberships	65.00	
Annual appropriation	150.00	$286.26

DISBURSEMENTS.

D. E. Moffett, premiums	$ 7.10	
W. R. Goy, premiums	8.00	
D. W. Lotspeich, premiums	1.00	
A. A. Simons, premiums	8.00	
W. M. Bomberger, premiums	12.00	
J. P. Hess, expenses as officer	6.50	
J. M. Bechtel, premiums	19.40	
F. P. Spencer, premiums	1.40	
D. B. McCalla, expenses as director	4.05	
D. B. McCalla, premiums	.50	
D. W. Lotspeich, expenses as director	9.75	
W. M. Bomberger, salary secretary	100.00	
W. M. Bomberger, printing for society	19.03	
J. M. Bechtel, expenses as president	12.89	
W. M. Bomberger, expenses as secretary, postage	12.00	
Balance	63.64	$286.26

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CHERRIES AND PLUMS.

M. J. WRAGG, DES MOINES.

From the topic assigned me I should judge that I am merely to tell you what the cherries and plums have done in my district during the past season.

You all know that it has been one of the most hazardous years that the fruit-grower has experienced since 1882 and 1883. The cherry and plum crops were largely destroyed by the freeze that we had on the night of April 28th when the mercury went down to twenty-one degrees above zero and remained for nearly thirty hours. All trees were either in full bloom or the fruit had already formed and the loss was complete in many cases. Cherries recuperated from the freeze and bore their second crop of bloom. As a rule, they were very weak, but there were a few cherries in my neighborhood. Some of the late blooming varieties bore quite a crop, especially where they were in locations with northern exposures.

What is said of the cherry is also true of the plum. Some of my neighbors around Des Moines had a very good crop of plums, but they were all from second bloom, following the freeze. We were able at least to put on an exhibit of about twenty varieties of plums at our State Fair, which convened the last days of August.

In general, there is quite an increased planting in my portion of the state in cherries, especially in Dallas, Polk and Madison Counties. The soil in this section is admirably adapted for the cherry, being high and rolling along the rivers.

In plums there is not as much interest among our growers in planting this fruit, for the reason, I presume, that we have not had a good plum crop for three years.

Young cherry trees were badly hurt by the freeze of the 28th of April and in many instances made but little growth during the summer. We had whole blocks of cherry one year old in the nursery that were so badly killed that they were dug up and destroyed.

The outlook for cherry and plum growing is very good and we believe the coming year there will be an increased planting in the cherry.

There has been much discussion among the growers here as to the best stock on which to grow the cherry for profit. Some claim that Mazzard is the best; others, Mahaleb. As far as I am able to judge personally, there is but little difference. I have in my orchard trees grown on both stocks.

M. J. WRAGG: There was some fruit in Polk and Dallas counties this year. These fruits need high well-drained lands. We have not had a full crop for three years. Americana plums have done best. Three cherry crops have been nearly a total loss or failure, stocks for cherry should be Mahaleb, and for plums, native roots as Marianna is not hardy.

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J. M. BECHTEL: I had a full crop of Miner, and Wild Goose plums, Forest Garden and Pottawattamie were loaded.

D. B. MCCALLA: Mr. Wragg, how about sweet cherries? Have eight or nine Yellow Glass fruiting that are very hardy; it is known as the Saylor cherry.

J. P. HESS: I planted 500 cherry trees. Fifteen years ago, Montmorency and Richmond stood the best. Wragg and Morello soon died, never saw much difference or any. Are these varieties extinct?

M. J. WRAGG: Their success is a question of locality and soil. There are places near Sioux City, Iowa, where as in Colorado, they are the most profitable cherry grown, are considered very desirable. It is with these cherries about the same as with Delicious apple; it has been planted for many years in Iowa, but has not succeeded well until planted in mountain states and west they succeed.

MR. J. P. HESS: After all the checkered career of fruit growing this season, grapes come out best in the most disastrous year we have ever had. First set of fruit buds was killed, and a new crop of buds developed and fruited. We will not make any mistake in growing grapes. It will pay to plant successful conducted vineyards, and more of them should be planted. This year at Council Bluffs, one vineyard of four acres produced $700 worth of fruit. Details must be carried out and care taken in pruning, culture and training.

Concord is the leader. Worden did well this year, Niagara does quite well in hill section.

C. H. DEUR: At Missouri Valley, we have a vineyard twelve years old. Moore Early are good on clay soils.

M. J. WRAGG: C. W. West, a neighbor, has eight acres of fine Concord, Worden, and Diamond; he uses a few Diamond on baskets of mixed grapes, they sell better than white grapes alone. The second bloom on his place made a good crop this year.

J. M. BECHTEL: I have some Campbell's Early, young vines in bearing, they did finely, I am well pleased with them. The bunches are large.

M. J. WRAGG: We manure grapes well on our soil.

W. M. BOMBERGER: It is advisable to only use old humus manuring unless it is on very steep hills, as near Council Bluffs where soil is very thin and will stand hot manure. M. J. Graham of Adel told me he lost a vineyard by mulching deep with manure

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to stimulate growth and save culture, the roots grew up near the surface and vines froze out in the winter.

Alex Woods of Council Bluffs made the best record in yields by applying slaughter house fertilizers on the Concord section of vineyard, one application was effective for three years, it more than doubled the yield and thrift of the vine. Moore's Early is a slow grower, and will stand manure on most any soil.

E. B. GAY: With me 100 Moore's Early on rich ground produced $100.00 worth of fruit on one-eighth acre.

WESLEY GREENE: Potash and phosphates are good fertilized for grapes.

D. B. MCCALLA spoke on fall and winter work in the orchard: Began pruning in January. Found hauling brush tiresome and changed my program. I cut all wood out of trimmings that will go as fuel and then cut up small branches, scatter them under the trees as a mulch. These are made so short that we can run cutter bar over them when mowing the orchard. Now, I did not like to put brush under trees, so we went to work and hauled manure and straw all we had, and some we bought in stacks and spread this on the cut branches under trees; this made a sort of a cushion under trees so it did not hurt good windfalls and served as a reservoir for moisture. These trees did much better than those not treated, they stood the drouth much better and the foliage on these trees was brighter, the larger trees were more thrifty during the test of drouth and high temperatures we passed through last summer.

D. W. LOTSPEICH: To get rid of brush easily, pile it in medium sized piles in the orchard; then we have constructed a drag horse rake, putting a horse at each end and drag them out on this rake.

D. R. MCCALLA: I fear fire in orchard and we are careful not to burn any brush in orchard.

W. E. GOY: Would keep brush out of the orchard.

J. M. BECHTEL: We prune early, then in fall clean out summer water sprouts a second time.

D. E. MOFFETT: It's a good plan to prune according to habit of growth. Trees like Mammoth Black Twig need peculiar treatment; it grows long limbs, open top, and bears wonderfully. I picked this summer 40 bushels out of a tree two feet through.

J. M. BECHTEL: Mammoth Black Twig is generally a shy bearer, but once in a while it will bear enormously.

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D. E. MOFFETT: Don't trim the south side of the tree too much, especially if tree is young, it starts sun scald. Early season pruning heals over nicely, later pruning leaves black scars.

Fulton is very vigorous and has long limb growth, it needs checking, it is a fine apple.

J. M. BECHTEL: Don't cut large limbs in fall, but you can remove water sprouts.

BARRELING AND BOXING.

WILLIAM R. GOY, TABOR.

Barreling and boxing is an art that the apple raisers of Iowa have not yet learned. If, in shipping, apples are to reach their destination in good condition, it is absolutely essential that they be properly boxed or barreled before shipment. Improper packing has, at least two serious results. In the first place, it causes great waste. In the second place it gives the grower the reputation for raising a much poorer grade of apples than he is capable of raising. In consequence, his apples do not command the high market price that they ought to command.

The sections of the country that have the greatest reputation for raising high grade apples, have gained this reputation largely by great care in shipping. The widely known fruit regions of Colorado, Utah, Idaho, Oregon and Washington, have been careful to send only their choicest apples to the distant markets. It is in this way that they have built up such a wonderful reputation for these sections of the country. In recent years we have proven that Iowa can raise an exceptionally high grade apple, but the country at large does not know it because we have been careless in shipping.

Iowa, of course, has not yet shipped in as large quantities as some states, but in the shipping which we have done, we have been very careless. I, myself, have merely dumped them into barrels, nailed up the barrels, and started them on their way. This is not the way they do in those sections of the country that have the greatest reputation as apple growers. In those states, they use great care in shipping.

It is now quite generally conceded that boxing is the best method. In this way it is possible to pack the apples much more firmly. Each apple is wrapped and fitted into its position with great care. This, of course, takes time, but it pays. Moreover, it is possible, with experience, to acquire great skill in this process of packing, and experts can pack with great rapidity. This method prevents the apples from shifting about and becoming bruised. It also tends to preserve both the substance and flavor of the apple.

By this method, the apples reach their destination in practically as good condition as when they were gathered from the trees. It is to be observed, also, that only the choicest apples go to the distant markets. In most cases, the poorer grade of apples are sold to the local trade. When

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this is understood, it is easy to understand why certain sections can keep up the reputation for raising apples of unusually high grade. It is not necessarily because they can raise better apples than certain other sections, but they are careful to allow no poor grade apples to get on market.

I, personally, have great faith in Iowa as an apple country, and when we begin to use scientific care in raising and judicious and skillful methods in shipping, it will be found that apple growing can be made one of our most profitable industries. We can raise apples of an exceptionally high grade, and we can raise them in great abundance.

WESLEY GREENE: The paper covers the subject very well. As good apples can be grown in Iowa as anywhere in the United States, if the grower will give the attention to his orchard that it needs.

C. H. DEUR: The paper covers the subject well. Don't know about boxing, it might not pay here.

M. J. WRAGG: We tried barrelling this year, sorry we used them, grade was so poor it would have paid to put them in car in bulk to job off. But the box is the coming package, as so many will buy a box and take it home when they would not a barrel. I find many take boxes of apples home on street cars that would not buy a barrel at all. Box is a popular package, and I would not be surprised that half boxes would come in vogue.

GEO. H. VAN HOUTEN: In the west the barrel has been eliminated and the box is the unit, in the east the barrel is the unit; advantage of the box is it can be easliy examined, barrel can be inspected,—there is more chance to deceive with the large package. Buyer knows he takes less chances on the box; this fixes a good reputation for the box.

D. W. LOTSPEICH: When you keep in mind quality, Iowa apples have it and if we only add western grading and packing, we can beat the world.

J. M. BECHTEL: It is unforunate that the man who has good apples has to compete with cheap bulk apples. Growers have got them and get so much per hundred from dealers for them, but afterward have to sell their good apples in competition with them.

C. H. DEUR: J. P. Garvin, Missouri Valley, put in a $250 canning plant, canned the grades and his surplus Wealthy apples. While the first season of running the home canning plant was an experiment and selling the product was a new factor, yet he realized 50 cents a bushel out of what he canned.

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He thinks he can do better another season and find a market for such goods. Most of this cheap stock can be taken care of this way.

This kind of canned goods should be contracted early. This he did not know, and hence did not sell as well as if he had gotten in regular channels of trade.

W. M. BOMBERGER: Think we will always have bulk apples. In a way it is good that quite a little fruit can go out cheap, as it popularizes it and many get fruit that could never afford it, and would not buy expensive barrelled or boxed fruit. Very fancy fruit it will pay to take pains with and wrap and box it. Mr. Greggs of Illinois, wraps and packs fancys, and established a reputation so he gets $5.00 per box, but if one ships large lots of boxed apples to many eastern points they have to unbox, barrel them, and re-ship west and sell as barreled stock.

J. M. BECHTEL: I received 75 cents per 100 for 4 carloads of culls.

D. B. MCCALLA: I got 25 cents per 100 for all my grades.

WESLEY GREENE: Apple butters and jellies would pay and we should try to interest more people in them.

GEO. H. VAN HOUTEN: Think Mr. Green touched a point we need impress. I was in Canada where there is a large market for such product. Alaska is a great market for it also. Think it would pay to put up the grade products in butters, jellies and jams.

BERRY BOXES AND BASKETS.

O. YOUNKERMAN, COUNCIL BLUFFS

Various efforts have been made to improve the berry box but with very little success. The Hallock and Leslie box made from poplar or gum wood has never been improved upon to any great extent. Efforts have been made to substitute paper for wood, but in my estimation it has not been successful. The paper box, although it has been sized so as to become impervious to an extent, has not gained much in favor as when it is used for very ripe or over ripe fruit it will collapse.

The folding box, as far as my knowledge goes, has only been made out of western spruce and is very light and lacks ventilation. The box is not nearly as substantial as the old style Hallock or the Leslie. My judgment is very much in favor of the Leslie box. It's peculiar shape makes it by far the best box for shipping, especially if the fruit is to remain any length of time in the case. By the peculiar shape I mean the perfect ventilation the fruit gets while packed in the case. The Hallock box in use

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most generally is the dry quart measure making it from the consumers' view point to be the most desirable; but when berries are sold by the box and not by the quart the Leslie box is certainly the more profitable to the grower, besides the first cost of the box is generally or always in favor of the Leslie.

The pint box should be used always for Red Raspberries, the nature of the fruit requiring a small package.

The berry box crate should have its share of attention. It should be well made, being securely nailed so that no accident may happen to its contents.

There is probably nothing so well adapted to marketing cherries and plums as the grape basket. The size of the basket is decided upon by the grower and the quantity to dispose of as well as the condition of the market.

For early cherries the berry box plays an important part.

We handle different sizes of grape baskets, 4-6-7 and 8 pounds. The bulk of the grape crop each year is marketed in 6 pound baskets which is no doubt the best. This is the size basket adopted by some of the shipping associations. There are seasons when it is probably more profitable to the grower to use a smaller package. The season just past for instance; the crop being small, more can be realized by using a smaller basket than an 8 pound; in fact we sold many more 4 pound baskets than usual. The 4 pound basket is used for certain varieties every year, especially the white and red varieties.

While it is very important to have the package neat and well made, yet a great deal depends on the packing. It takes time to properly face a box of cherries or a basket of grapes, yet we believe it is time well spent. It does not of a necessity follow that the bottom of the box or basket should be inferior fruit. Our conclusion is that the Leslie quart box for berries is the best, and the eight pound Climax grape baskets are the most reliable and profitable.

As to other fruit the size of the package will always be regulated by the grower and the supply and demand for the crop.

J. M. BECHTEL: For retailing fancy packages of grapes, I use two and one-half pound baskets for retailing Campbell's Early.

C. H. DEUR: I use the seven-pound baskets which I find very satisfactory for my general grape crop of Concord, Moore's and Worden.

E. B. GAY: I use the Leslie quart box, fruit handles better in this box.

W. M. BOMBERGER: These are not so satisfactory to deliver direct to customer, and goes better to dealer from the grower, but the public appreciates the Halleck box because it is larger.

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WESLEY GREENE: Replying to question asked about the value of the oak, I wish to say it is not appreciated as it should be. The Pin oak is especially valuable because it grows rapidly. It is native to Iowa. The seed is easily obtained and seedings are easily transplanted and grow nearly as fast as a Soft Maple. In removing a large tree, it is advisable to dig around under it and cut off the tap root, then fill in around tree again and let it stand another year to form new roots, then it can be safely transplanted.

E. B. GAY: I like the American Linden.

W. M. BOMBERGER: Good as the American Linden is, the European form is a far better tree here in Iowa. Old specimens are found on the H. A. Terry place and are fine.

J. B. HESS: I am interested in the English Walnut, and while in Pennsylvania this summer my interest increased. Such fine nuts and these fine nut growing trees attracted my attention and got me interested in them, and we are making a trial of them on our farvorable fruit lands at Council Bluffs, Iowa.

M. J. WRAGG: We hope Mr. Hess will succeed. Around Des Moines and in our old experimental station at Waukee, we got enthusiastic over the English Walnut, they did well for a while, but a year would come along not so favorable and freeze them out.

M. J. WRAGG: Norway Maple is a fine tree, it is better in growth than Sugar Maple and establishes quicker, and is more satisfactory tree to plant. It is almost exactly like our Sugar Maple, but is a much more satisfactory tree. I regard Catalpa Speciosa as a valuable tree for commercial purposes.

W. M. BOMBERGER: Even the hardy form I consider a poor tree to plant and in its place I would plant American Sweet Chestnut. You get wood just as valuable and our trees produce satisfactory crops of chestnuts.

M. J. WRAGG: English Walnuts after being out five or six years get up to six to eight feet high, and then in some unfavorable winter are frozen down. We got the hardiest forms we could from Col. Brackett of both it and Pecans, and did not succeed with them.

W. M. BOMBERGER: I like the sweet chestnut and would plant it in preference to catalpa, then you will have as good wood as catalpa, and fruit besides and a prettier tree.

C. H. DEUR: I planted a half mile avenue of them eight years ago, all did well, never lost a tree. Catalpa grow fine for me.

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Lime-Sulphur Mixture.

PROFFESSOR BLISS: It is a good thing to control curculio and plum pocket, but it is not a pleasant thing to use. Its use is in experimental stage, and in early summer work before foliage it can be used one-fifth, and when foliage in on one-forty-fifth strength.

J. P. HESS: Cannot it be prepared at home?

PROFESSOR BLISS: Easily. Use 15 pounds sulphur to 15 pounds lime in water boiled, and apply hot. Where one uses much of it in a large orchard, it is best to make it at home, where small quantities are used, it is best to buy it.

PREPARING FOR WAR IN TIME OF PEACE.

F. P. SPENCER, RANDOLPH.

This subject was suggested to me by our secretary, and having in mind the wars of past seasons on insects and scab, to say nothing of Mr. Jack Frost, or hail or the many other vicissitudes that comes to the poor optimistic fruit grower, I will try in a short paper to plan a campaign for the spring of 1911, hoping to reach camp ere dark to find plenty of "top rails" good water and a full ration of food suitable to our needs when camp is reached.

The first attack will be directed against the ever present and ever growing surplus limbs, which we, armed with proper weapons (shears and saw) will without any effort to flank charge upon, and not rest until the last limb or water sprout that needs killing is duly and properly killed and cremated. After pruning comes spraying, and we don't need to charge anything in this movement, as the parties of which we buy spraying materials and implements have done the charging to a finish, and all that remains for us is to apply this material to the trees, and incidentally to ourselves, horses, harness and wagon. Truly spraying is a most dainty and delightful job, but if emoluments were equal I would prefer to go fishing or run for office. After having once thoroughly sprayed, and the bugs have partially recovered from the debilitating effects supposed to follow such an onslaught, the proper thing is to spray again. If this job of spraying only lasted the year around, I would be perfectly willing to enlist for life (by paying a substitute to do it for me.) But enough of this. I suppose the one question that is uppermost in the minds of Southwestern Iowa fruit growers, just now, is whether we will have as unfavorable spell of weather at the critical period next spring as visited us in April and May of the season just past, and if so what is the best thing to do in the way of frost fighting.

There has been quite a lot of printers' ink used in the past few months, telling how completely and thoroughly a crop of apples were saved by artificial heating in Fremont County, but so far as I have read,

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nothing has been said about other crops of apples that were raised within three miles of the orchard so mentioned, and that without any heating or other aid whatever, and the crop was nearly double the crop of the Fremont County orchard. It has been said it were far better not to know too much than to know so much that is not so.

In looking over the apple crop while driving around the country the past summer, the one thing that struck me as being quite out of the ordinary was the extremely narrow zone between orchards with the crop entirely destroyed by the frost, and those having full crops. This strip, or zone, is not more than five miles wide, and in that strip were more or less apples.

In company with our worthy President, I visited in September, what is known as the Holly orchard, situated about three miles on a straight line from the Mincer orchard in a southwest direction, and we found the Holly orchard without any protection in the way or shelter, or any effort of artificial heating, to have what we decided a full crop, while the Mincer orchard (bear in mind the distance) with all the efforts put forth to save the crop from frost, had only about a good half crop, and I could not help thinking that weather conditions might have something to do in both instances.

Orchard heating under normal conditions can possibly be made a success, but with the wind blowing forty miles an hour; the air full of snow and the thermometer registering 24 degrees, I think the job is beset with difficulties, to state the case mildly. All of which is most respectfully submitted.

The Society was given an hour's talk on the question of transportation by Hon. Clifford Thorne, Railroad Commissioner, of Washington, Iowa.

An extended address was also given on the Aesthetic, Ethic, and Moral Side of Horticulture, by Rev. C. G. Marshall, of Corning.

No papers of these addresses were furnished for publication.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Your committee on president's address are in most hearty accord with recommendations made. Especially do we wish to call attention and emphasize that portion of report for the year 1910 on percentage of fruit grown, and on his observation as to the relative merit of orchard heaters. Especially would we call attention to the fine display of fruit made by our worthy president without aid of orchard heaters, but showing the results of systematic spraying, as set forth in the address.

M. J. WRAGG,
WM. R. GOY,
D. B. MCCALLA,
Committee.

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REPORT OF COMMITTEE ON SECRETARY'S REPORT.

Your committee on Secretary's report having read it very carefully, hereby indorse what is said regarding regulating freight rates and the enforcing of all pure food laws and measures, and recommend the acceptance of the report as a whole.

M. J. WRAGG,
WM. R. GOY,
D. B. MCCALLA,
Committee.

REPORT OF COMMITTEE ON TREASURER'S REPORT.

We, your committee on Treasurer's report, have checked the vouchers of the Treasurer, and examined his books, and find them correct, as reported.

D. W. LOTSPICH,
WM. R. GOY,
Committee.

REPORT OF COMMITTEE ON AWARDS.

Your Committee on Awards of Premiums report as follows:
Best Individual Display, $7.00, J. M. Bechtel.
Best County Display, $6.00, J. M. Bechtel.
Best Commercial Display, first premium, $5.00, J. M. Bechtel.
Best Individual Display, second premium, $5.00, J. M. Bechtel.
Above from 21 varieties, 130 plates.
Second Best Commercial Display (Wealthy), $3.00, J. M. Bechtel.
Second Best Individual Display, $5.00, W. R. Goy.
Taken from four varieties, 12 plates.
Best Display Cut Flowers, $2.50, W. M. Bomberger.
An honorable recognition and complimentary award for specimen of Jonathan of 1909 crop to D. W. Lotspeich.

General discussion on cabbage pests and melon louse.

HENRY FIELD: I have kept track of what has been offered to destroy the cabbage worms and find this one among the best: two teaspoonsful of common commercial lie to a bucket of water, spray cabbage with it. Also, tabacco dust that you can get at 5 cents a pound, dust them with this; rains wash it off.

J. P. HESS: Melon louse did great damage in gardens and melon fields in and around Council Bluffs, and application of tobacco stems around the hills of plants stopped the pest.

Election of officers resulted as follows:

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M. J. Wragg, President, Des Moines.
D. B. McCalla, Vice-President, Clarinda.
Geo. H. Van Houten, Secretary, Lenox.
W. M. Bomberger, Treasurer, Harlan.

DIRECTORS.

First District, F. P. Spencer, Randolph.
Second District, D. E. Moffett, Corning.
Third District, no director chosen.
Fourth District, C. H. Deur, Missouri Valley.
Fifth District, E. B. Gay, Griswold.
Sixth District, Clayton O. Garrett, Adelphi.

On motion Third district directorship was to be filled by appointment.

On motion Woodbine was selected as next place of meeting; time of meeting to be fixed by members of executive committee.

HOT-BEDS AND COLD FRAMES ON HOME GROUNDS.

WESLEY GREENE, DAVENPORT.

By using hot-beds gardening may begin six weeks or two months earlier than it could without them. They will not take the place of greenhouses, nor are they as satisfactory in very cold weather when the thermometer remains for several days below zero, yet, most florists and market gardeners find them almost indispensable toward spring to relieve the congested condition of their greenhouses. They serve as a cheap substitute for much needed glass at that time.

If hot-beds are well managed, plants will grow as well in them as in greenhouses. The success of the beds depends on the attention given to them. During cold frosty nights the glass must be covered with shutters to retain the heat. The shutters are made from half inch lumber, and should be the same size as the sash. On beds twelve feet long, inch board may be used without nailing them together, or canvas may be used. When an extremely cold night comes the whole bed should be covered with hay or straw to keep out the frost. This covering may remain on for a day or two without injury to the plants, but do not neglect to give the plants air and sunlight at the earliest opportunity.

Should the bed get cold on account of the heating material being too dry, or from long continued use, the heat may be increased by making holes in it with a pointed stick and pouring in boiling water, then closing the holes again.

If a novice in the business, a frame six feet wide and twelve feet long will be large enough to begin with. Select an open, sunny place for the bed. If protected from the north and west winds, it will be much easier to keep it warm.

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To make a hot bed of the size mentioned, throw loosely in a pile about 300 cubic feet of fresh horse manure with considerable litter in it. As soon as it begins to heat, fork it over, and in two or three days you can turn it again.

If the bed is to be made on the surface of the ground, spread a layer eight inches thick of hot manure over a space eight by fourteen feet, and pack well by tramping it down with the feet. The firmer you make the bed, the longer it will retain the heat. Add layer on layer until the bed is eighteen inches in height,—it is then ready for the frame. This is usually made of inch boards, ten to twelve inches high in front, and sixteen to eighteen inches at the back. Three inch strips are set in every three feet with an inch by inch and one-half nailed in the center to separate the sashes and keep them in place. When complete, put on the bed and pack manure up around the outside, then put in the soil, enough to cover the bed five or six inches deep, when seeds are to be sown in it.

If the seeds are sown in flats, two or three inches of soil will be enough to catch the ammonia from the fermenting manure. If the soil is frozen when put on the bed, it will be in good condition to plant by the time the bed has cooled to 80 degrees. A thermometer should be kept in the bed all the time when in use.

Half of the bed may be sown to lettuce and radishes, the remainder can be used for other seeds or set with plants. All garden seeds that are to be transplanted should be sown in flats on finely sifted soil. Small seeds, like petunias, begonias, and ferns, should not be covered, but pressed into the soil. To water these flats after the seed has been sown in them, it is better to set the flats in a tub so that the water may soak up from below. The seeds are not washed away when watered in this manner. Cover the flats with a pane of glass to retain the moisture, and shade with heavy paper until the seeds germinate.

When the temperature is above 70 deg. with bright sunlight, let in a little air. When there are a variety of plants to be grown in one bed, it is better to put in a partition so that one end of the bed may be kept 10 or 15 degrees warmer than the other section.

Hot-beds are useful in starting dormant plants in spring, like dahlias, cannas, etc., and for propagating geraniums, coleus, and other plants.

Cold frames are made the same as hot beds, the only difference is that the heating material is omitted. They are useful in hardening plants before setting them in the open soil.

In this cilmate we would not recommend starting a hot-bed before the first of March. Cloth may be used on the beds instead of glass later in the season. It should be made waterproof and airtight by painting with a hot mixture consisting of one part tallow, one part linseed oil, and two parts resin. Beds or frames covered with cloth will not get as hot as when glass is used. While hot-beds and cold frames are indispensable in the garden and on the home grounds where much gardening is done, yet no well-regulated homestead should be without a small greenhouse.

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NOTES ON CONSERVATION MEETING AT ST. PAUL, MINN.

W. M. BOMBERGER, HARLAN.

Conservation in theory, thought, fact and in action, had a red letter day in early September, 1910, in which the writer had an active part and participation.

We were somewhat astonished at the magnitude of the meeting, the intense interest in it, and at the width and extensive scope of the movement.

The presence of President Taft and ex-President Theodore Roosevelt added dignity and inspiration to a gathering that two days had attendance of nearly 30,000 per day, with a regular session of 1,000 to 1,500 persons in the more business routine sessions.

Enemies of conservation were numerous, but admitted the righteousness of the cause.

At first thought, most people think that the work is narrowed to conserving the forests and natural timber supply. All kinds of interests have risen, knocked at the doors of this congress, and much has been admitted that makes it the most truly wonderful aggregation of reforms united under one name.

The real thought of going slow, turning every vital force in all human progress to good account, is commendable, but what struck the speaker as remarkable was the fact that this idea was taken up so strongly and urged so radically by "progressives" in political action should be so in the lead in expounding and pushing conservation, the very essence of "standpat" doctrines. Here standpatters wanted to cut loose, let everything be gobbled up, and progressives to hold back and conserve.

There are no narrow lines of work in the movement, in fact it was so broad that this great meeting, working carefully its way along new lines of organization, assumed proportions such that it had to be systematized into a series of sections and departments, and then these grouped. To illustrate: The central and most important work was to consider and set aside the natural timber, water rights, power sites, coal and fuel resources, so that present generations would be benefited, and yet these benefits would go on in development, and benefit future generations. Instead of this, public property is being exploited for the benefit of the few. lock up resources into holdings of great corporations to make arbitrary and excessive costs for necessaries of life, and is to be developed by such means or methods as will truly develop them, and still be a regular source of comforts to life, and some resource to the government who is to only lease and to have active perpetual control of these public properties.

Coal lands, timber lands, public rivers, waterways, power sites, are but the most well-known lines of work of this congress.

There is also conservation of soils in which was intense interest. Agricultural colleges from most of the states had strong forces there in this department, and the Southern states and the newer states West were intensely active. This section held separate meetings with demonstrations, lectures of highest importance, and attended with intense interest.

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Public health: Conserving of public health was an equally strong department. Its work was far reaching in this matter, and the Red Cross movement took intense interest in this department, and this section of the great convention was a most enthusiastic part of the congress.

Conservation of morals and of ethics was strong.

Conservation of the rights of woman came up and was abundantly well looked after.

It was remarkable what widely different interests were here in this meeting, and agreed upon the justice of the movement and righteousness of the cause.

For a while it was thought that the enemies of the movement would control the meeting and kill it. A great deal was done to palliate, smooth over and allay the feeling existing against wholesale gobbling up of public lands and fuel supply and water rights, but availed nothing.

After it was discovered that the Roosevelt and Pinchot idea was the fixed idea, and ruled the congress, that federal control should largely prevail, states rights was sprung and gigantic corporations all over the west in land, coal, and water-power sites, had their attorneys to defend state control on the floor of the congress. This brought confusion. About every state west of the Mississippi was represented by delegations, and most of southern states with governors and state officers, and about every large mining, lumber and power site combination had high-priced and competent attorneys to push the state control idea. But when they took the floor it was found that these delegations were so divided in opinion and not in harmony with each other, delegations on same floor would contest each others remarks and produce inharmonious consideration and intense excitement on the open floor. But the arrival of Theodore Roosevelt turned the scale, and the convention uproariously followed his and Pinchot's lead and direction of more extended federal control. In the excitement of debate, conservative speakers like J. J. Hill took the states right side, but his presentation of his argument with the statement that he made that we were running all our people to Canada by taking our domain out of public, depriving them of homes here to make the great reservations now in west was well put and received, but J. J. Hill's argument went down before the bold declaration of Henry Wallace that it was not our reservations so much as it was the one cent a mile rate excursions and railroad booming of Canadian lands that run the people out of the states. Wallace's speech brought down the house and made him president elect of this great congress.

Many members of congress were present, as well as most of President Taft's cabinet. Conspicuous was Secretary Wilson, an ultra partisan of Theodore Roosevelt, and the deposed Forester Pinchot made the most of the situation he could to his credit, for he largely organized this remarkable movement. Lumbermen from Canada, Wisconsin, Michigan, Minnesota, and representatives of great lumber corporations in the west and south, miners and rich mine owners with families loaded with jewels, mingled with delegates from farms and cities, made at once a remarkable aggregate and combination. Banquets were spread, political gatherings

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mixed in with the session that made a profusion of entertainment and association that was at once unique and novel.

But the second day of meeting the central figure was the most remarkable, when Theodore Roosevelt "come to town". He proved the central figure and force of the meeting.

The listener and writer went to St. Paul with not just the highest degree of confidence in Theodore Roosevelt. But seeing and hearing and experiencing events as they occurred at St. Paul dispelled all doubts as to him as a man, as a leader, and as a patriot. There is something infectious in the air when he is present.

As an example, we personally had an idea that he was rather coarse and rough and short in manner and deportment, and of the bullying type so familiar in frontier life, yet frankly open and good to meet. Our position was less than 50 feet from him in this great meeting from which we had the best of view and opportunity to hear him and see the effect of him and his personality upon an audience of well up to 30,000 people.

He is of kindly and manly bearing, voice is not strongly masculine, but clear, kindly, earnest to the point of being serious. Every word was in manuscript that was not closely followed, but from which was most exceeding careful delivery. Each sheet was crumpled in a mass and thrown violently on the floor to his feet, to make emphatic some point until he was wading ankle deep in a mass of his manuscript. At least 30,000 crowded outside auditorium and the streets at time of his address and it took 150 strong men to get him through the crowd in and out of the building. In all this aggregation of people, the persons of station, wealth and influence crowded nearest and forced themselves as his associations, but he would pay little attention to them, and if some little girl would raise up as a salute a Teddy Bear it received his immediate attention and salute, and we saw him step out of an auto through a crowd of illustrious associates, congressmen, senators, cabinet officers, mining kings, financiers to speak to a Minnesota farm wife who had a family of small children all in very ordinary farm clothing. Roosevelt is certainly a remarkable man in the way his personality draws others, and is a man that is to be reckoned with in the future, and this conservation idea of this congress is one of his pet ideas and to hear him and his exposition of it will convince.

His speech in the auditorium was continued at State Fair grounds where an area of ten acres was covered with shouting admirers to hear the ex-president.

It was estimated that nearly 400,000 persons saw and heard this leader on this occasion.

The movement of conservation as represented in this meeting is so large that it appears unwieldy and its varied and extended scope makes it one of the most extensive and far reaching movements to handle yet inaugurated, and only broad men of more than ordinary gauge and capacity can direct such a movement. All Iowans felt great pride in Iowa having the presidency and leadership in Henry Wallace.

The practical determination and action of this movement might be summed up as follows:

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In the past public forests were under a legislative act patented and deeded outright promiscuously to anyone or corporation, same was so of coal lands, water rights, power sites.

This great body vigorously and unanimously voted with the approval of President Taft and ex-President Roosevelt that in the future all such are to go out into private possession under lease and fee under limited time contract.

His honor and excellency, Wm. H. Taft, President, made the resolutions of this great conservation meeting in full a part of the text of his message to the present session of congress.

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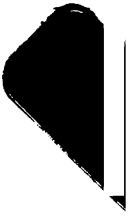

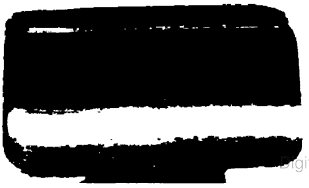

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